D-Link®

User Manual

DIR-815

Wireless N600 Dual Band Router

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CHAPTER 1. INTRODUCTION

Contents and Audience

This manual describes the router DIR-815 and explains how to configure and operate it.

This manual is intended for users familiar with basic networking concepts, who create an in-home local area network, and system administrators, who install and configure networks in offices.

Conventions

Example	Description
text	The body text of the manual.
Before You Begin	A reference to a chapter or section of this manual.
"Quick Installation Guide"	A reference to a document.
Change	A name of a menu, menu item, control (field, checkbox, drop-down list, button, etc.).
`192.168.0.1`	Data that you should enter in the specified field.
! Information	An important note.

Document Structure

Chapter 1 describes the purpose and structure of the document.

Chapter 2 gives an overview of the router's hardware and software features, describes its appearance and the package contents.

Chapter 3 explains how to install the router DIR-815 and configure a PC in order to access its web-based interface.

Chapter 4 describes all pages of the web-based interface in detail.

Chapter 5 includes safety instructions and tips for networking and connecting additional equipment.

Chapter 6 introduces abbreviations and acronyms used in this manual.

CHAPTER 2. OVERVIEW

General Information

The DIR-815 device is a wireless dual band router a built-in 4-port switch. It provides a fast and simple way to create a wireless and wired network at home or in an office.

You are able to connect the wireless router DIR-815 to a cable or DSL modem or to a private Ethernet line and use a high-speed Internet connection to successfully fulfill a wide range of professional tasks. The built-in 4-port switch enables you to connect Ethernet-enabled computers, game consoles, and other devices to your network.

Using the DIR-815 device, you are able to quickly create a wireless network at home or in your office, which lets your relatives or employees connect to your wireless network virtually anywhere (within the operational range of your wireless network). The router can operate as an access point for connecting wireless devices of the standards 802.11a, 802.11b, 802.11g, and 802.11n (at the rate up to 600Mbps[1]).

The router supports multiple functions for the wireless interface: several security standards (WEP, WPA/WPA2), MAC address filtering, WPS, WMM.

The router is equipped with Airgain built-in omnidirectional antennas. In spite of their compact size, such antennas can compete and even exceed performance of traditional whip antennas. Airgain antennas provide high gain (4dBi for 2.4GHz band and 6dBi for 5GHz band) and circular pattern in both horizontal and vertical plane; due to this, Airgain antennas show excellent performance in any direction, increase wireless network range and minimize occurrence of blind spots.

The wireless router DIR-815 includes a built-in firewall. The advanced security functions minimize threats of hacker attacks, prevent unwanted intrusions to your network, and block access to unwanted websites for users of your LAN.

You can configure and manage the settings of the wireless router DIR-815 via the user-friendly web-based interface (the interface is available in several languages).

1 Up to 300Mbps for 2.4GHz and up to 300Mbps for 5GHz.

*Specifications**

Hardware

WAN Interface

- 1 10/100BASE-TX Ethernet port for cable or DSL modem or private Ethernet line

LAN Interface

- 4 10/100BASE-TX Ethernet ports

WLAN Interface

- IEEE 802.11n (up to 600Mbps[2])
- IEEE 802.11a/b/g

Frequency Range

- 802.11a
  - 5725 ~ 5850MHz ISM band
- 802.11b
  - 2400 ~ 2483.5MHz ISM band
- 802.11g
  - 2400 ~ 2483.5MHz ISM band
- 802.11n
  - 2400 ~ 2483.5MHz ISM band
  - 5725 ~ 5850MHz ISM band

Data Rate

- 802.11a
  - 54, 48, 36, 24, 18, 12, 9, and 6Mbps
- 802.11b
  - 11, 5.5, 2, and 1Mbps
- 802.11g
  - 54, 48, 36, 24, 18, 12, 9, and 6Mbps
- 802.11n
  - 2.4GHz: MCS0 ~ MCS15 (up to 300Mbps)
  - 5GHz: MCS0 ~ MCS15 (up to 300Mbps)

Modulation Schemes

- 802.11a: BPSK, QPSK, 16QAM, 64QAM with OFDM
- 802.11b: DQPSK, DBPSK, DSSS, CCK
- 802.11g: BPSK, QPSK, 16QAM, 64QAM with OFDM
- 802.11n: BPSK, QPSK, 16QAM, 64QAM with OFDM

* The device features are subject to change without notice. For the latest versions of the firmware and relevant documentation, visit www.dlink.ru.

2 Up to 300Mbps for 2.4GHz and up to 300Mbps for 5GHz.

Receiver Sensitivity

- 802.11a (typical at PER = 10% (1000-byte PDUs) at room temperature 25 °C)
  - -85dBm at 6Mbps
  - -84dBm at 9Mbps
  - -82dBm at 12Mbps
  - -80dBm at 18Mbps
  - -77dBm at 24Mbps
  - -73dBm at 36Mbps
  - -69dBm at 48Mbps
  - -68dBm at 54Mbps
- 802.11b (typical at PER = 8% (1000-byte PDUs) at room temperature 25 °C)
  - -82dBm at 1Mbps
  - -80dBm at 2Mbps
  - -78dBm at 5.5Mbps
  - -76dBm at 11Mbps
- 802.11g (typical at PER = 10% (1000-byte PDUs) at room temperature 25 °C)
  - -85dBm at 6Mbps
  - -84dBm at 9Mbps
  - -82dBm at 12Mbps
  - -80dBm at 18Mbps
  - -77dBm at 24Mbps
  - -73dBm at 36Mbps
  - -69dBm at 48Mbps
  - -68dBm at 54Mbps
- 802.11n (typical at PER = 10% (1000-byte PDUs))
  - 2.4GHz, HT20
  - -82dBm at MCS0/8
  - -79dBm at MCS1/9
  - -77dBm at MCS2/10
  - -74dBm at MCS3/11
  - -70dBm at MCS4/12
  - -66dBm at MCS5/13
  - -65dBm at MCS6/14
  - -64dBm at MCS7/15
  - 2.4GHz, HT40
  - -79dBm at MCS0/8
  - -76dBm at MCS1/9
  - -74dBm at MCS2/10
  - -71dBm at MCS3/11
  - -67dBm at MCS4/12
  - -63dBm at MCS5/13
  - -62dBm at MCS6/14
  - -61dBm at MCS7/15

Transmitter Output Power

The maximum value of the transmitter output power depends upon the radio frequency regulations applied in your country

- 802.11a (typical at room temperature 25 °C)
  - 15dBm (+/-1.5dB) at 6Mbps
  - 15dBm (+/-1.5dB) at 9Mbps
  - 15dBm (+/-1.5dB) at 12Mbps
  - 14dBm (+/-1.5dB) at 18Mbps
  - 14dBm (+/-1.5dB) at 24Mbps
  - 13dBm (+/-1.5dB) at 36Mbps
  - 13dBm (+/-1.5dB) at 48Mbps
  - 13dBm (+/-1.5dB) at 54Mbps
- 802.11b (typical at room temperature 25 °C)
  - 17dBm (+/-1.5dB) at 1Mbps
  - 17dBm (+/-1.5dB) at 2Mbps
  - 17dBm (+/-1.5dB) at 5.5Mbps
  - 17dBm (+/-1.5dB) at 11Mbps
- 802.11g (typical at room temperature 25 °C)
  - 17dBm (+/-1.5dB) at 6Mbps
  - 17dBm (+/-1.5dB) at 9Mbps
  - 17dBm (+/-1.5dB) at 12Mbps
  - 16dBm (+/-1.5dB) at 18Mbps
  - 16dBm (+/-1.5dB) at 24Mbps
  - 15dBm (+/-1.5dB) at 36Mbps
  - 15dBm (+/-1.5dB) at 48Mbps
  - 15dBm (+/-1.5dB) at 54Mbps
- 802.11n (typical at room temperature 25 °C)
  - 2.4GHz, HT20
  - 16.5dBm (+/-1.5dB) MCS0/8
  - 16.5dBm (+/-1.5dB) MCS1/9
  - 16.5dBm (+/-1.5dB) MCS2/10
  - 16dBm (+/-1.5dB) MCS3/11
  - 16dBm (+/-1.5dB) MCS4/12
  - 15.5dBm (+/-1.5dB) MCS5/13
  - 15dBm (+/-1.5dB) MCS6/14
  - 14dBm (+/-1.5dB) MCS7/15
  - 2.4GHz, HT40
  - 16.5dBm (+/-1.5dB) MCS0/8
  - 16.5dBm (+/-1.5dB) MCS1/9
  - 16.5dBm (+/-1.5dB) MCS2/10
  - 16dBm (+/-1.5dB) MCS3/11
  - 16dBm (+/-1.5dB) MCS4/12
  - 15.5dBm (+/-1.5dB) MCS5/13
  - 15dBm (+/-1.5dB) MCS6/14
  - 14dBm (+/-1.5dB) MCS7/15

Software

Network Functions

- WAN connection types:
  - PPPoE
  - Static IP
  - Dynamic IP
  - PPTP/L2TP + Static IP
  - PPTP/L2TP + Dynamic IP
- DHCP server and client
- DNS relay
- VPN pass-through (PPTP/L2TP)
- Dynamic DNS
- Static IP routing
- Remote management
- Network statistics for each interface
- IGMP Proxy
- RIP
- UPnP
- Support of VLAN
- Flow control
- TR-069 client
- WAN ping respond

Wireless Connection

- Supported security settings:
  - WEP
  - WPA/WPA2 Personal
  - WPA/WPA2 Enterprise
- MAC filter
- Managing connected stations
- PIN and PBC methods of WPS
- WMM (Wi-Fi QoS)
- Advanced settings
- Support of client mode

Firewall Functions

- Network Address Translation (NAT)
- Stateful Packet Inspection (SPI)
- IP filters
- MAC filter
- URL filter
- DMZ
- Prevention of ARP and DDoS attacks
- Virtual servers

Configuration and Management

- Multilingual web-based interface for configuration and management
- Access via TELNET
- Firmware update via web-based interface
- Saving/restoring configuration to/from file
- Support of remote logging
- Automatic synchronization of system time with NTP server and manual time/date setup
- Ping function
- Traceroute utility

Physical and Environmental

LEDs

- Power
- WPS
- INTERNET
- 2.4GHz
- 5GHz
- 4 LAN LEDs

Power

- External power adapter DC 12V/0.5A
- Power on/off button
- Reset to Factory Defaults button
- WPS button

Operating Temperature

- From 0 to 40 ^{0}C (from 32 to 104 ^{0}F)

Storage Temperature

- From -20 to 65 ^{0}C (from -4 to 149 ^{0}F)

Operating Humidity

- From 10% to 90% non-condensing

Storage Humidity

- From 5% to 95% non-condensing

Product Appearance

Front Panel

Figure 1. Front panel view.

LED	Mode	Description
POWER	*Solid green*	The router is powered on.
	No light	The router is powered off.
WPS	*Blinking green*	Attempting to add a wireless device via the WPS function.
	No light	The WPS function is not in use.
INTERNET	*Solid green*	The Internet connection is on.
	Blinking green	The WAN interface is active (upstream or downstream traffic).
	No light	The cable is not connected.
2.4GHz **5GHz**	*Solid green*	The router's WLAN of the relevant band is on.
	Blinking green	The WLAN interface of the relevant band is active (upstream or downstream traffic).
	No light	The router's WLAN of the relevant band is off.
LAN 1-4	*Solid green*	A device (computer) is connected to the relevant port, the connection is on.
	Blinking green	The LAN port is active (upstream or downstream traffic).
	No light	The cable is not connected to the relevant port.

Side Panel

Figure 2. Side panel view.

Name	Description
WPS	A button to quickly add wireless devices to the router's WLAN (the WPS function). To use the WPS function: push the button, hold it for 2 seconds, and release when the **WPS** LED starts blinking.

Back Panel

Figure 3. Back panel view.

Port	Description
LAN 1-4	4 Ethernet ports to connect computers or network devices.
INTERNET	A port to connect to a cable or DSL modem or to a private Ethernet line (it is recommended to use the cable included in the delivery package).
RESET	A button to restore the factory default settings. To restore the factory defaults, push the button (with the device turned on), hold it for 7 seconds, and then release the button.
12VDC IN	Power connector.
ON/OFF	A button to turn the router on/off.

The device is also equipped with built-in Wi-Fi antennas.

Delivery Package

The following should be included:

- Wireless router DIR-815
- Power adapter DC 12V/0.5A
- Ethernet cable (CAT 5E)
- "***Quick Installation Guide***" (brochure).

The "***User Manual***" and "***Quick Installation Guide***" documents in Russian and English are available on D-Link website (see ftp.dlink.ru/pub/Router/DIR-815/Description/RevC/).

! Using a power supply with a different voltage rating than the one included will cause damage and void the warranty for this product.

CHAPTER 3. INSTALLATION AND CONNECTION

Before You Begin

Please, read this manual prior to installing the device. Make sure that you have all the necessary information and equipment.

Operating System

Configuration of the wireless dual band router DIR-815 a built-in 4-port switch (hereinafter referred to as "the router") is performed via the built-in web-based interface. The web-based interface is available from any operating system that supports a web browser.

Web Browser

The following web browsers are recommended:

- Apple Safari 5 and later
- Google Chrome 5 and later
- Microsoft Internet Explorer 7 and later
- Mozilla Firefox 5 and later
- Opera 10 and later.

For successful operation, JavaScript should be enabled on the web browser. Make sure that JavaScript has not been disabled by other software (such as virus protection or web user security packages) running on your computer.

Wired or Wireless NIC (Ethernet or Wi-Fi Adapter)

Any computer that uses the router should be equipped with an Ethernet or Wi-Fi adapter (NIC). If your computer is not equipped with such a device, install an Ethernet or Wi-Fi adapter prior to using the router.

Wireless Connection

Wireless workstations from your network should be equipped with a wireless 802.11a, b, g, or n NIC (Wi-Fi adapter). In addition, you should specify the values of SSID, channel number and security settings defined in the web-based interface of the router for all these wireless workstations.

Connecting to PC

PC with Ethernet Adapter

1. Make sure that your PC is powered off.
2. Connect an Ethernet cable between any of LAN ports located on the back panel of the router and the Ethernet port of your PC.
3. Connect the power cord to the power connector port on the back panel of the router, then plug the power adapter into an electrical outlet or power strip.
4. Turn on the router by pressing the **ON/OFF** button on its back panel.
5. Turn on your PC and wait until your operating system is completely loaded.

Obtaining IP Address Automatically in OS Windows XP

1. Click the **Start** button and proceed to the **Control Panel > Network and Internet Connections > Network Connections** window.
2. In the **Network Connections** window, right-click the relevant **Local Area Connection** icon and select the **Properties** line in the menu displayed.

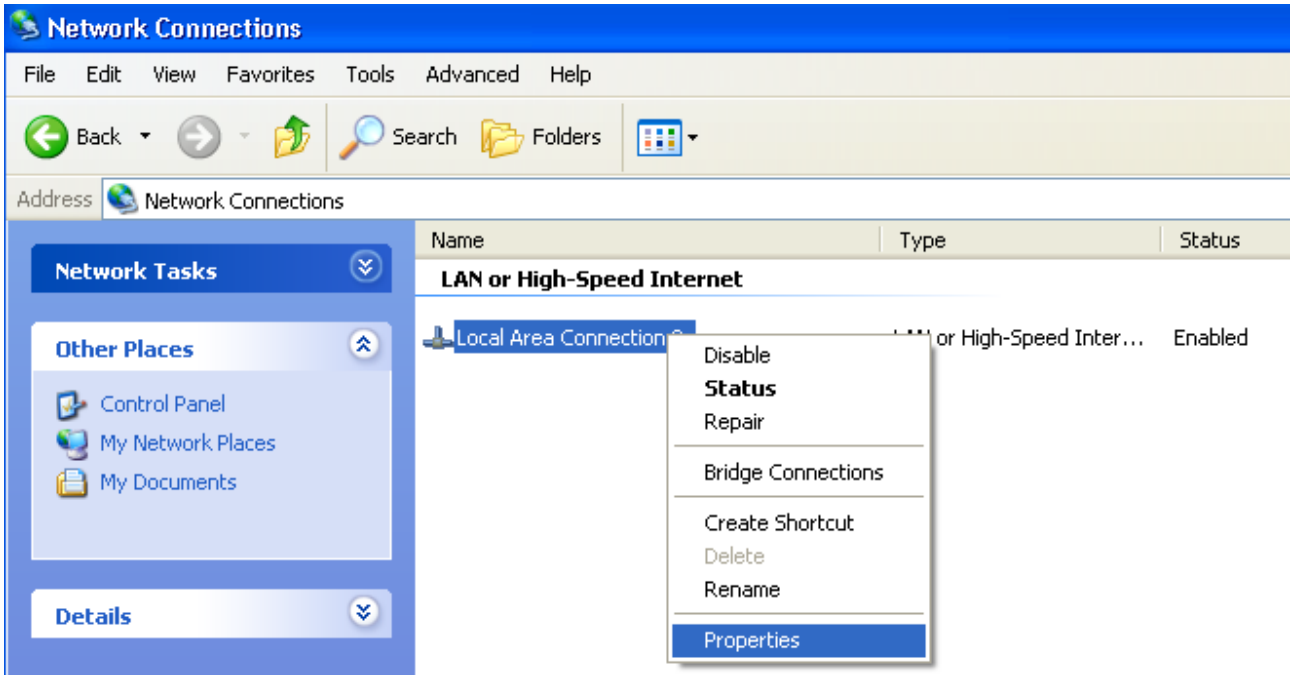

*Figure 4. The **Network Connections** window.*

3. In the **Local Area Connection Properties** window, on the **General** tab, select the **Internet Protocol (TCP/IP)** line. Click the **Properties** button.

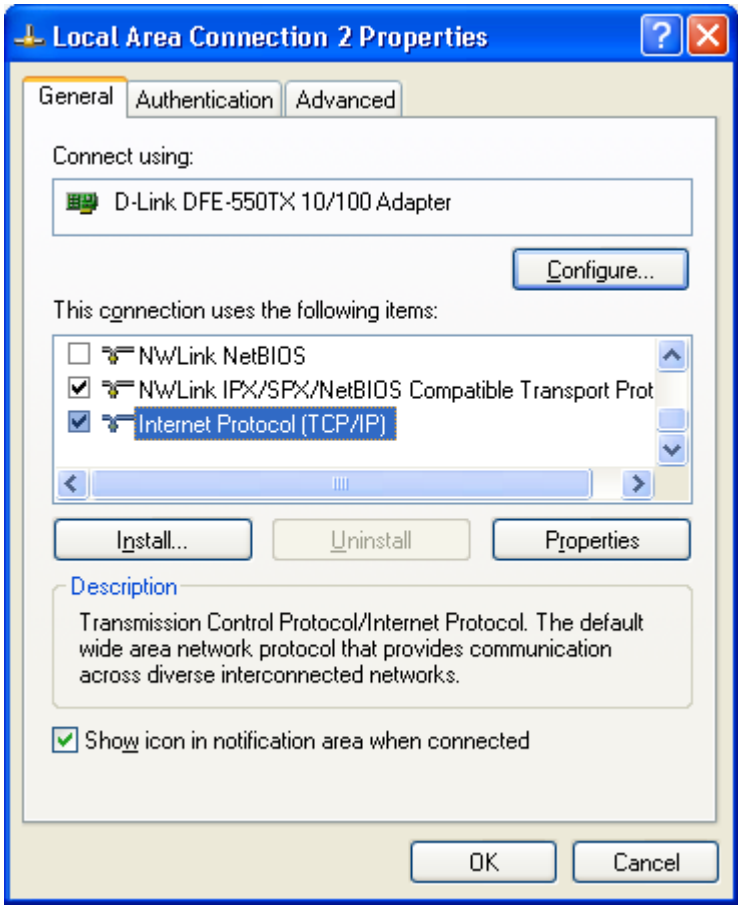

*Figure 5. The **Local Area Connection Properties** window.*

4. Select the **Obtain an IP address automatically** and **Obtain DNS server address automatically** radio buttons. Click the **OK** button.

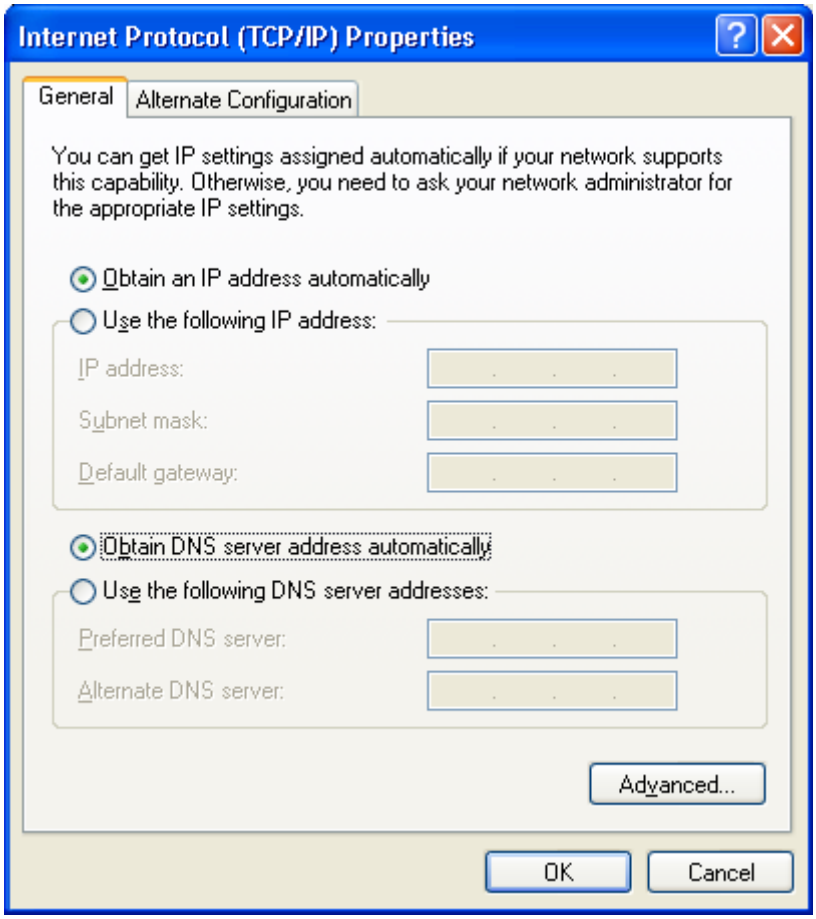
Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

*Figure 6. The **Internet Protocol (TCP/IP) Properties** window.*

5. Click the **OK** button in the connection properties window.

Now your computer is configured to obtain an IP address automatically.

Obtaining IP Address Automatically in OS Windows 7

1. Click the **Start** button and proceed to the **Control Panel** window.
2. Select the **Network and Sharing Center** section. (If the Control Panel has the category view (the **Category** value is selected from the **View by** drop-down list in the top right corner of the window), choose the **View network status and tasks** line under the **Network and Internet** section.)

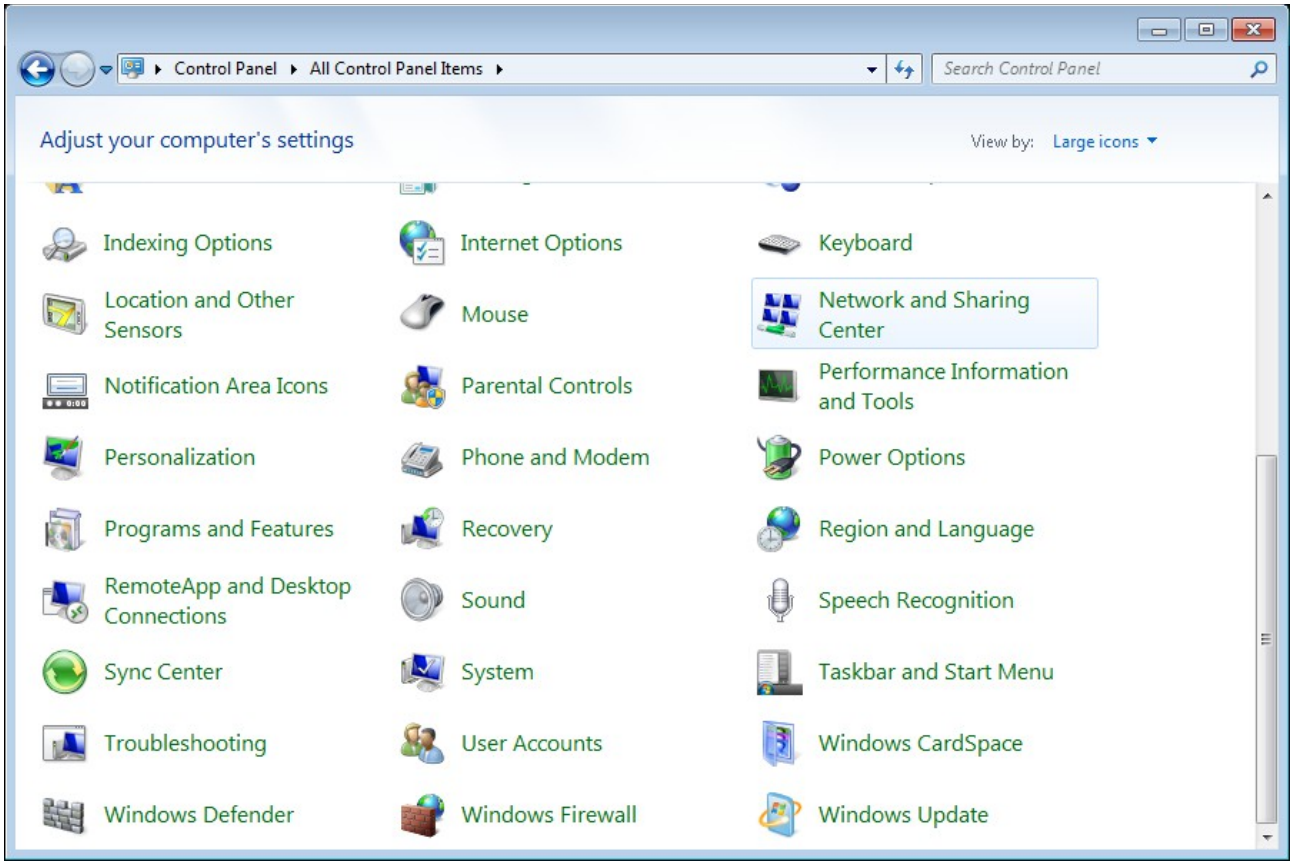

*Figure 7. The **Control Panel** window.*

3. In the menu located on the left part of the window, select the **Change adapter settings** line.

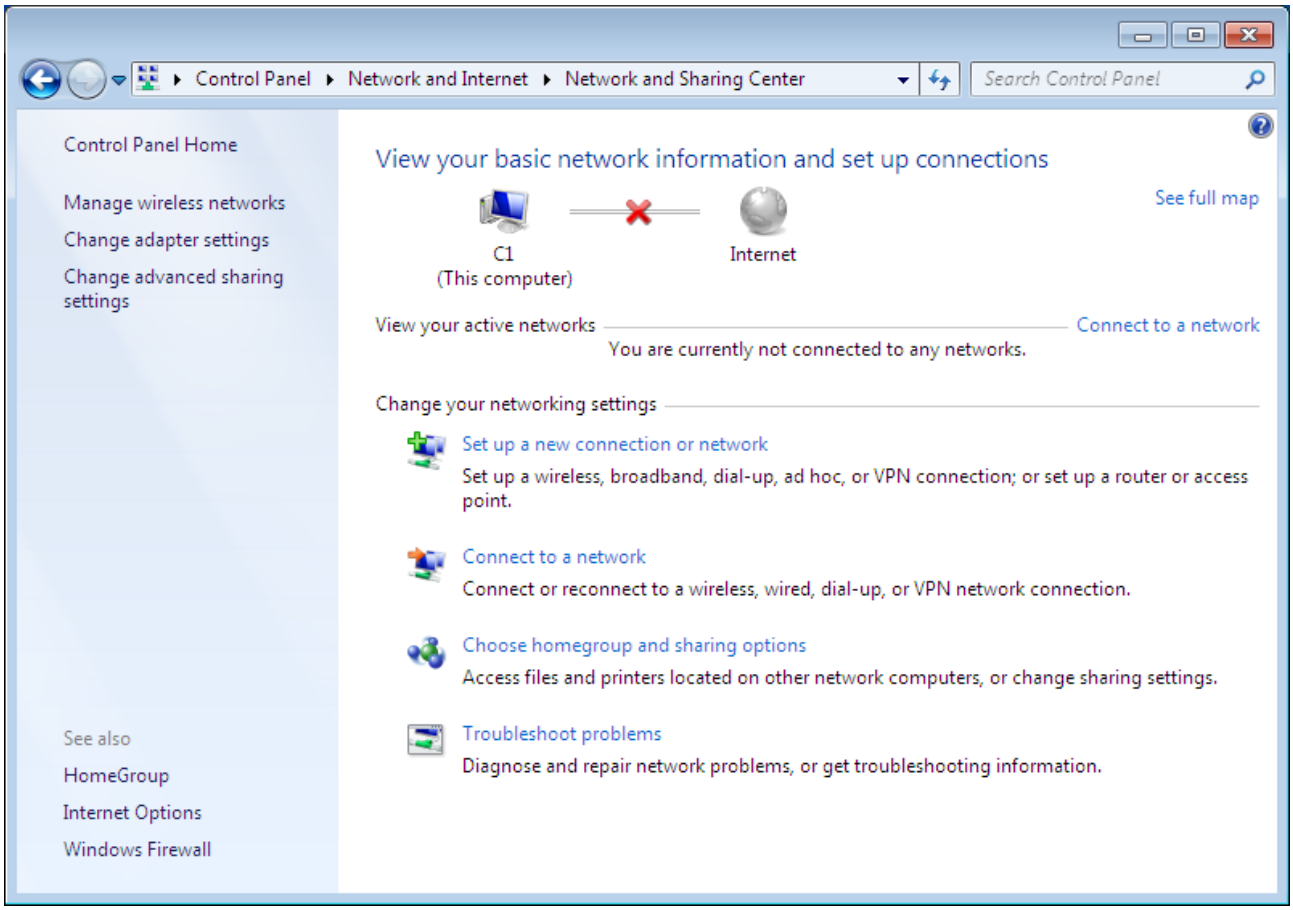
Control Panel ▸ Network and Internet ▸ Network and Sharing Center
Search Control Panel
Control Panel Home
Manage wireless networks
Change adapter settings
Change advanced sharing settings
View your basic network information and set up connections
See full map
C1
(This computer)
Internet
View your active networks
Connect to a network
You are currently not connected to any networks.
Change your networking settings
Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.
Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.
Choose homegroup and sharing options
Access files and printers located on other network computers, or change sharing settings.
Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.
See also
HomeGroup
Internet Options
Windows Firewall

*Figure 8. The **Network and Sharing Center** window.*

4. In the opened window, right-click the relevant **Local Area Connection** icon and select the **Properties** line in the menu displayed.

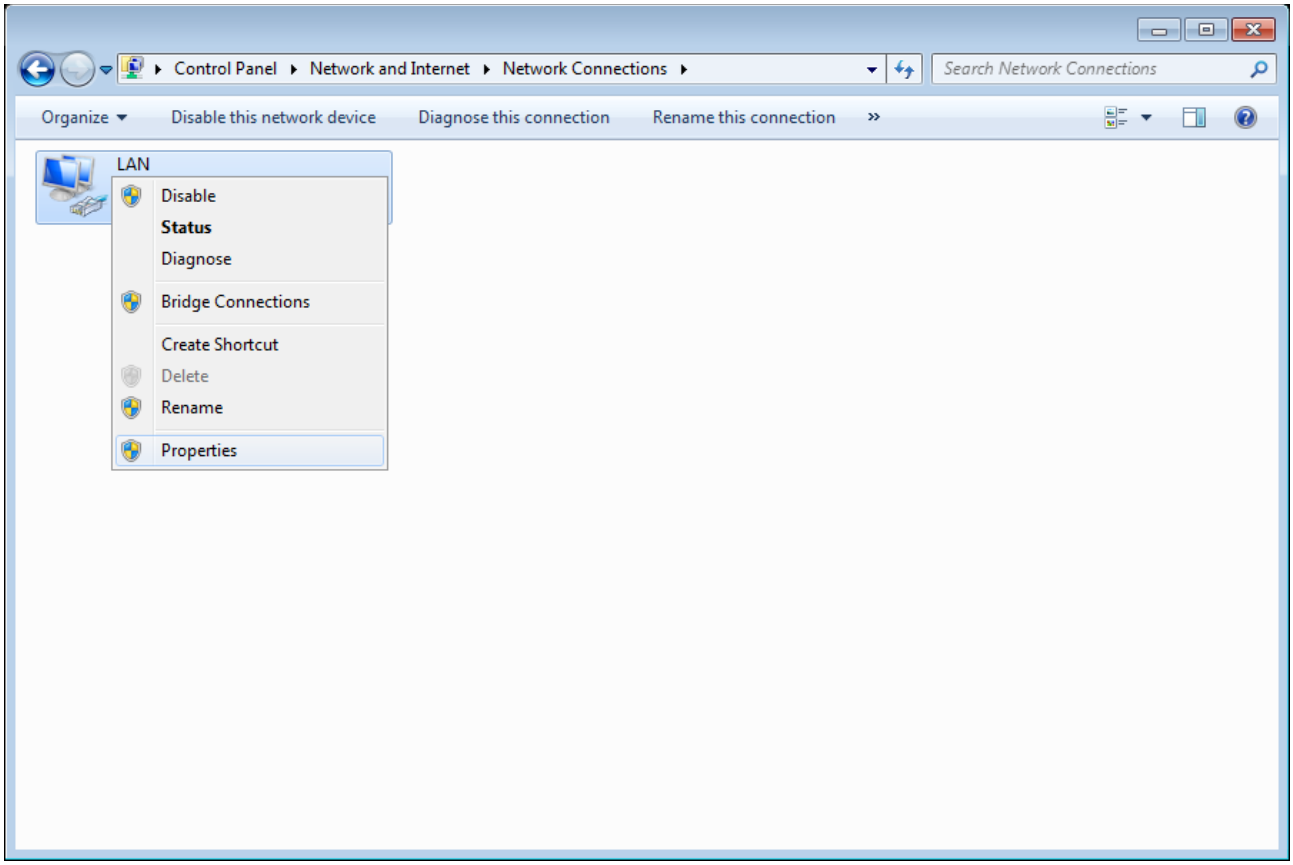

*Figure 9. The **Network Connections** window.*

5. In the **Local Area Connection Properties** window, on the **Networking** tab, select the **Internet Protocol Version 4 (TCP/IPv4)** line. Click the **Properties** button.

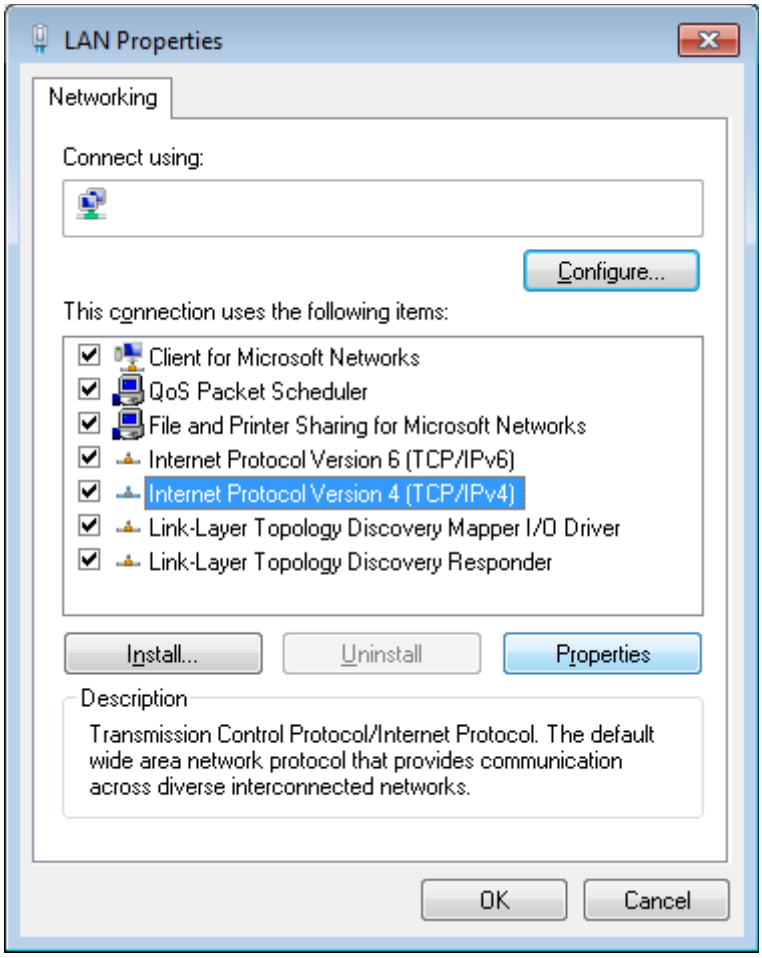

*Figure 10. The **Local Area Connection Properties** window.*

6. Select the **Obtain an IP address automatically** and **Obtain DNS server address automatically** radio buttons. Click the **OK** button.

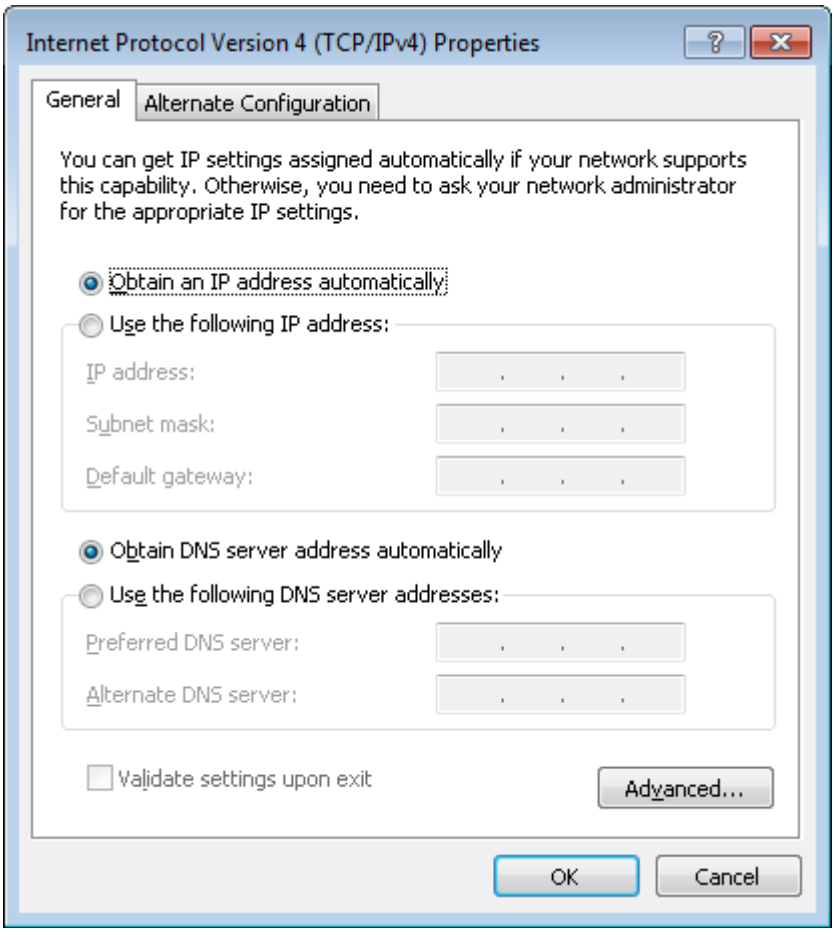
Internet Protocol Version 4 (TCP/IPv4) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

*Figure 11. The **Internet Protocol Version 4 (TCP/IPv4) Properties** window.*

7. Click the **OK** button in the connection properties window.

Now your computer is configured to obtain an IP address automatically.

PC with Wi-Fi Adapter

1. Connect the power cord to the power connector port on the back panel of the router, then plug the power adapter into an electrical outlet or power strip.
2. Turn on the router by pressing the **ON/OFF** button on its back panel.
3. Turn on your PC and wait until your operating system is completely loaded.
4. Turn on your Wi-Fi adapter. As a rule, modern notebooks with built-in wireless NICs are equipped with a button or switch that turns on/off the wireless adapter (refer to your PC documents). If your PC is equipped with a pluggable wireless NIC, install the software provided with your Wi-Fi adapter.

Configuring Wi-Fi Adapter in OS Windows XP

1. Click the **Start** button and proceed to the **Control Panel > Network and Internet Connections > Network Connections** window.
2. Select the icon of the wireless network connection and make sure that your Wi-Fi adapter is on.

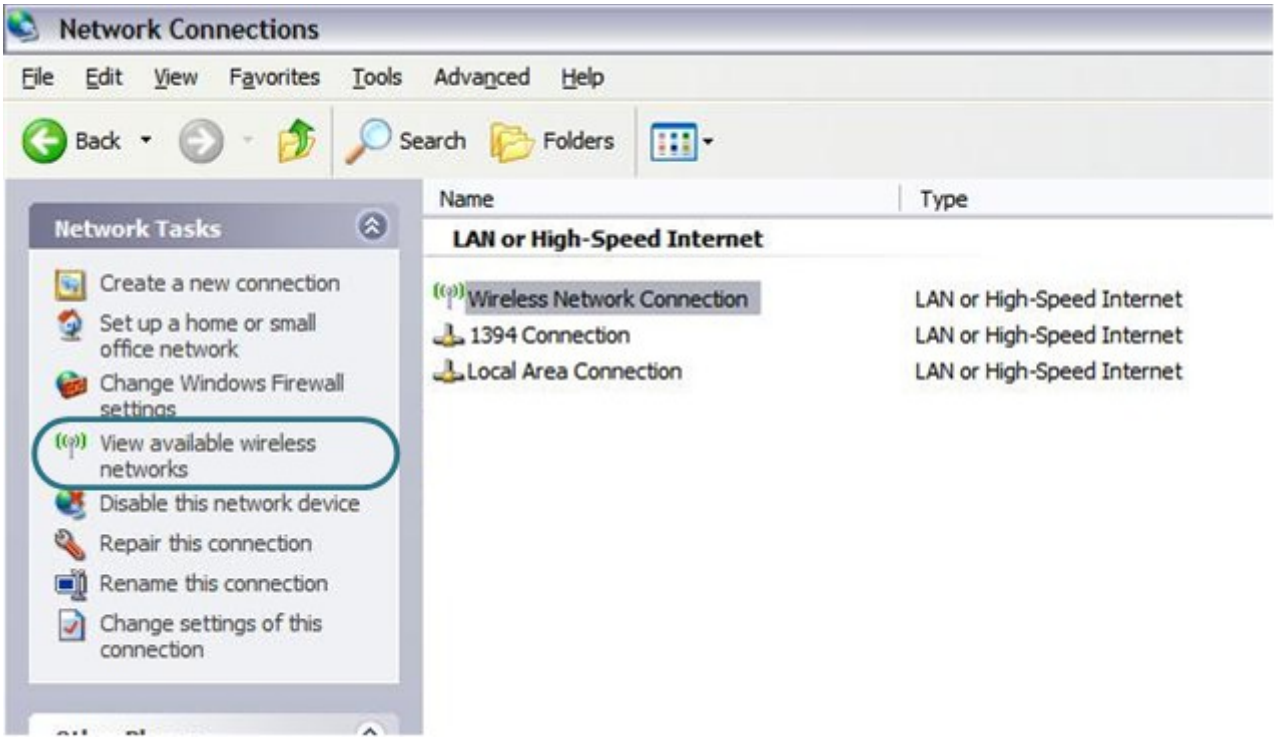

*Figure 12. The **Network Connections** window.*

3. Search for available wireless networks.
4. In the opened **Wireless Network Connection** window, select the wireless network **DIR-815** (for operating in the 2.4GHz band) or **DIR-815-5G** (for operating in the 5GHz band) and click the **Connect** button.

After that the **Wireless Network Connection Status** window appears.

! If you perform initial configuration of the router via Wi-Fi connection, note that immediately after changing the wireless default settings of the router you will need to reconfigure the wireless connection using the newly specified settings.

Configuring Wi-Fi Adapter in OS Windows 7

1. Click the **Start** button and proceed to the **Control Panel** window.
2. Select the **Network and Sharing Center** section. (If the Control Panel has the category view (the **Category** value is selected from the **View by** drop-down list in the top right corner of the window), choose the **View network status and tasks** line under the **Network and Internet** section.)

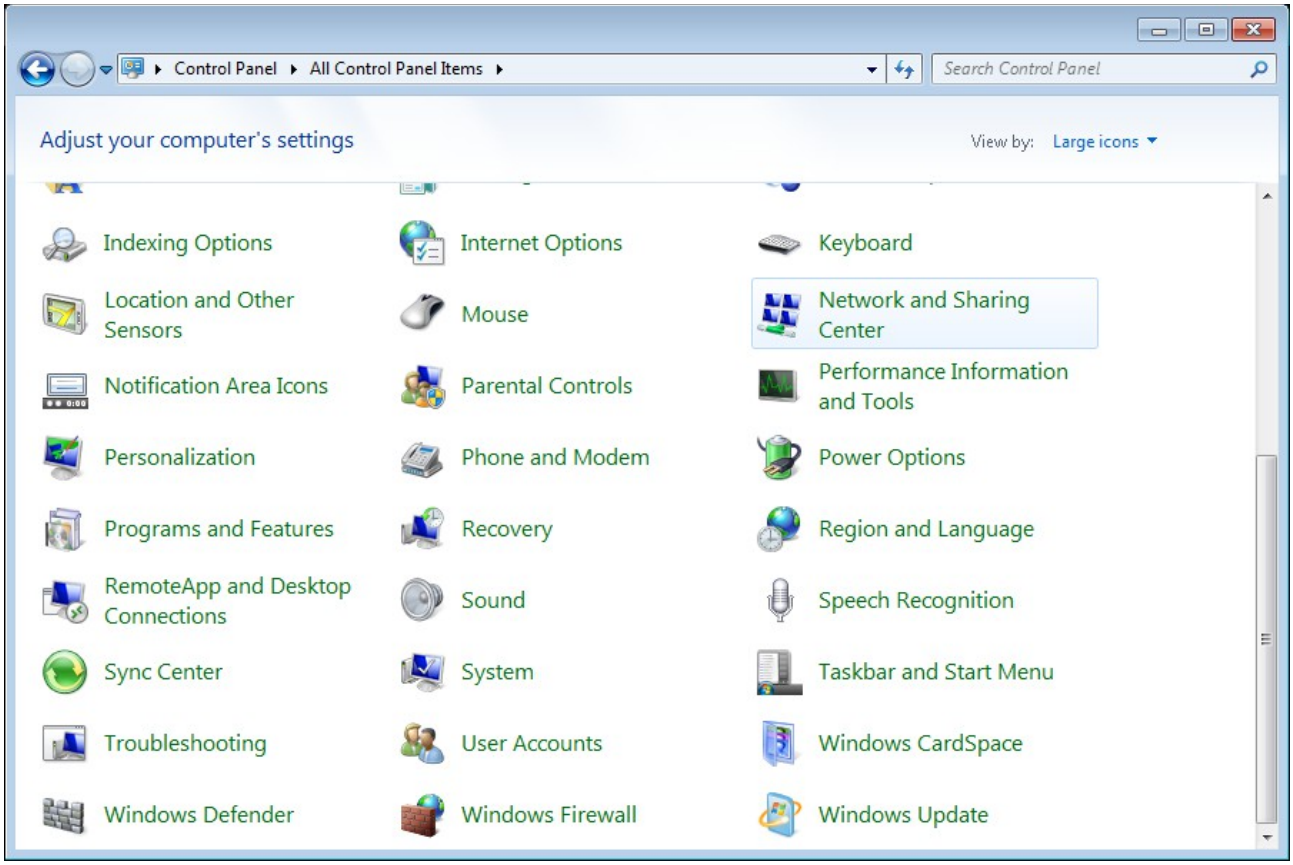

*Figure 13. The **Control Panel** window.*

3. In the menu located on the left part of the window, select the **Change adapter settings** line.
4. In the opened window, select the icon of the wireless network connection and make sure that your Wi-Fi adapter is on.
5. To open the list of available wireless networks, select the icon of the wireless network connection and click the **Connect To** button or left-click the network icon in the notification area located on the right side of the taskbar.

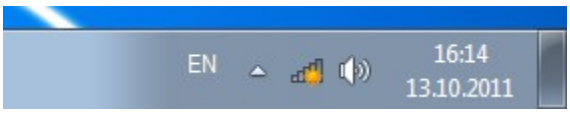

Figure 14. The notification area of the taskbar.

6. In the opened **Wireless Network Connection** window, select the wireless network **DIR-815** (for operating in the 2.4GHz band) or **DIR-815-5G** (for operating in the 5GHz band) and click the **Connect** button.

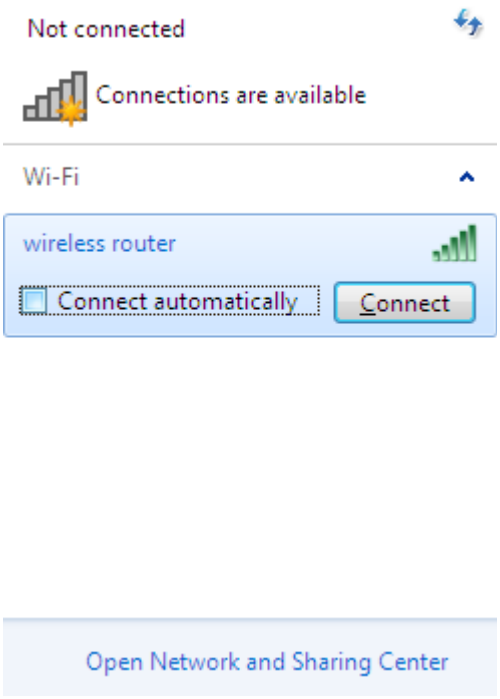

Figure 15. The list of available networks.

7. Wait for about 20-30 seconds. After the connection is established, the network icon will be displayed as the signal level scale.

If you perform initial configuration of the router via Wi-Fi connection, note that immediately after changing the wireless default settings of the router you will need to reconfigure the wireless connection using the newly specified settings.

Connecting to Web-based Interface

When you have configured your computer, you can access the web-based interface and configure needed parameters (create a WAN connection, change the parameters of the wireless network, specify the settings of the firewall, etc.).

1. Start a web browser (see the ***Before You Begin*** section, page 15).
2. In the address bar of the web browser, enter the IP address of the router (by default, the following IP address is specified: **192.168.0.1**). Press the **Enter** key.

Figure 16. Connecting to the web-based interface of the DIR-815 device.

3. On the opened page, enter the username and password for the administrator account in the **Login** and **Password** fields correspondingly (by default, the following username and password are specified: **admin**, **admin**). Then click the **Enter** link.

Figure 17. The login page.

If the error "*The page cannot be displayed*" (or "*Unable to display the page*"/"*Could not connect to remote server*") occurs upon connecting to the web-based interface of the router, make sure that you have properly connected the router to your computer.

Right after the first access to the web-based interface you are forwarded to the page for changing the administrator password specified by default.

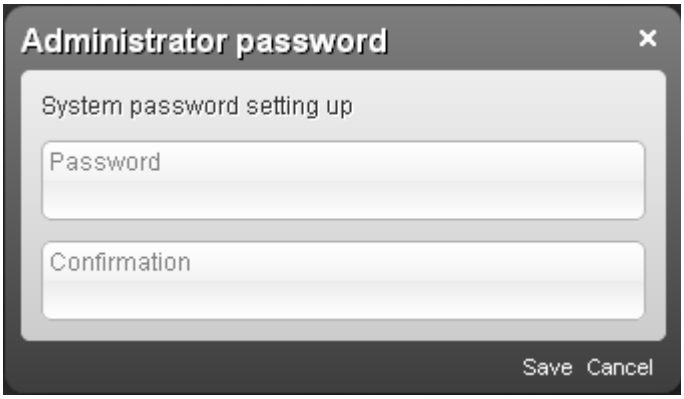

Figure 18. The page for changing the default administrator password.

Enter a new password in the **Password** and **Confirmation** fields (you may use digits, Latin letters (uppercase and/or lowercase), and characters available on the keyboard), then click the **Save** link.

! Remember or write down the new password for the administrator account. In case of losing the new password, you can access the settings of the router only after restoring the factory default settings via the hardware **RESET** button. This procedure wipes out all settings that you have configured for your router.

Web-based Interface Structure

After successful registration the router's quick settings page opens.

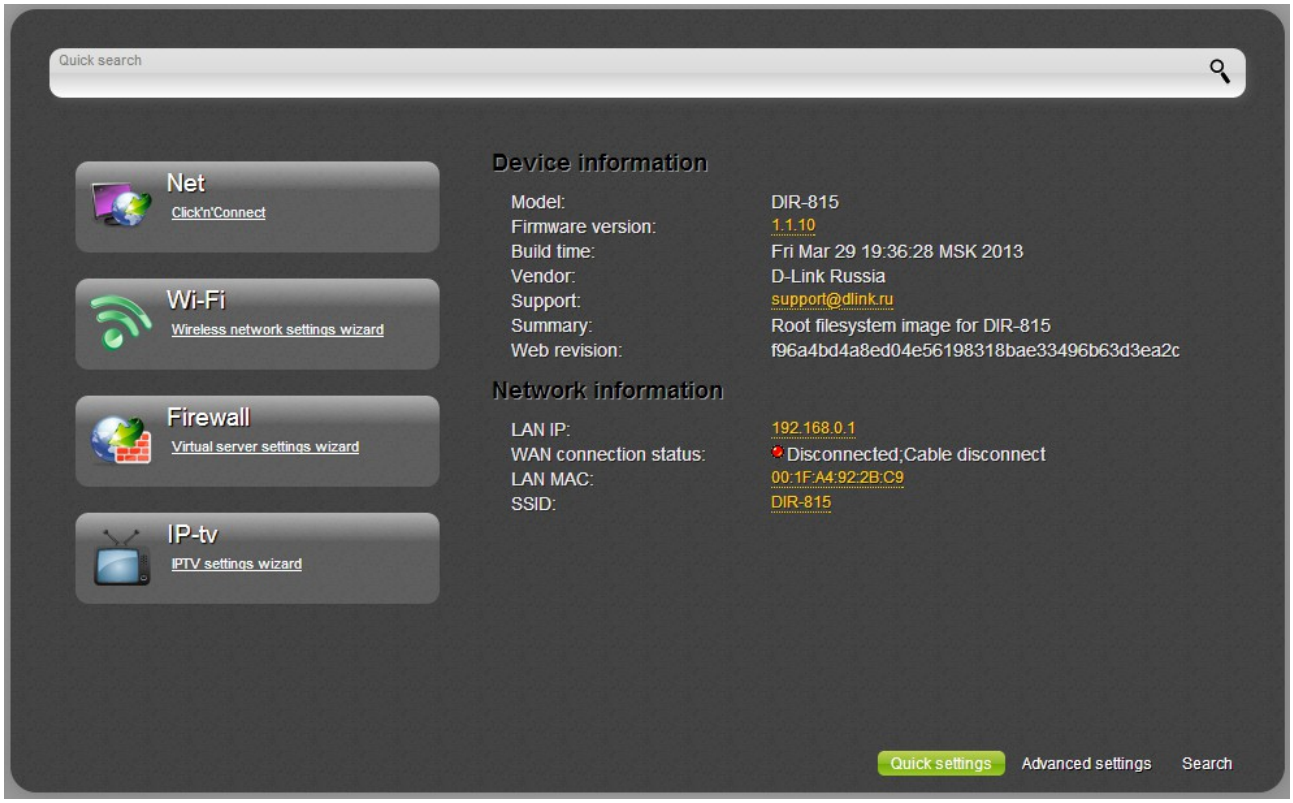

Figure 19. The quick settings page.

The web-based interface of the router is multilingual. Select a needed language from the menu displayed when the mouse pointer is over the **Language** caption. You can change the language of the web-based interface in any menu item.

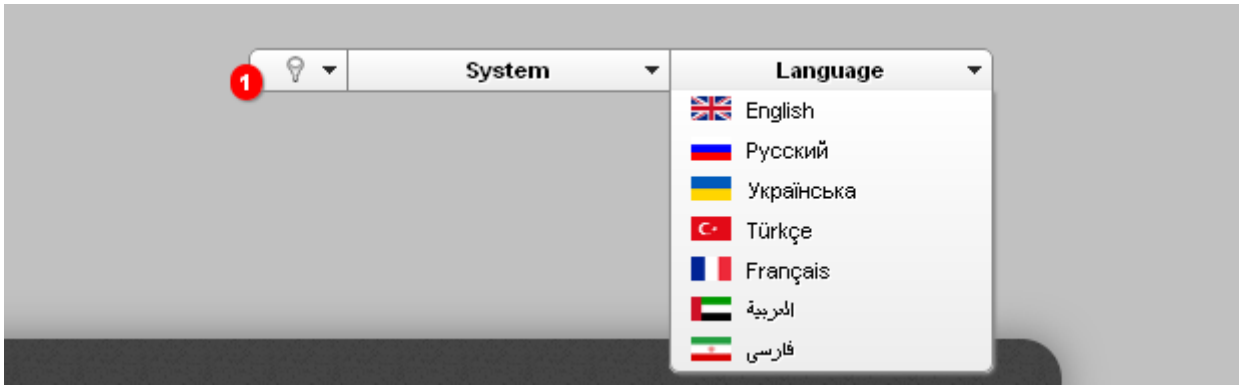

Figure 20. Changing the language of the web-based interface.

After selecting the language, the notification on unsaved changes will be displayed. Click the **Save** icon ( ) to save the current language of the web-based interface as the default language.

The quick settings page displays general information on the router and its software (the version and the date of the firmware, the IP address of the device, the name of the 2.4GHz WLAN, etc.).

On the quick settings page you can run a needed Wizard, quickly get to some pages of the web-based interface, search for a specific page, or switch to the advanced settings section.

To upgrade the firmware of the router, left-click the current firmware version (the right column of the **Firmware version** line). After clicking the line, the **System / Firmware upgrade** page opens (for the detailed description of the page, see the ***Firmware Upgrade*** section, page 164).

To contact the technical support group (to send an e-mail), left-click the support e-mail address (the right column of the **Support** line). After clicking the line, the e-mail client window for sending a new letter to the specified address opens.

To edit the router's local interface parameters, left-click the IP or MAC address of the local interface (the right column of the **LAN IP** line or **LAN MAC** line correspondingly). After clicking the line, the page for editing the LAN interface opens (for the detailed description of the page, see the ***LAN*** section, page 106).

To configure the router's WLAN parameters, left-click the SSID of the WLAN (the right column of the **SSID** line). After clicking the line, the **Wi-Fi / Basic settings** page opens (for the detailed description of the page, see the ***Basic Settings*** section, page 109).

To configure connection to the Internet, click the **Click'n'Connect** link in the **Net** section (for the detailed description of the Wizard, see the ***Click'n'Connect*** section, page 36).

To configure the router's wireless network, click the **Wireless network settings wizard** link in the **Wi-Fi** section (for the detailed description of the Wizard, see the ***Wireless Network Settings Wizard*** section, page 73).

To configure access from the Internet to a web server located in your LAN, click the **Virtual server settings wizard** link in the **Firewall** section (for the detailed description of the Wizard, see the ***Virtual Server Settings Wizard*** section, page 78).

To configure the router to use an IPTV set-top box, click the **IPTV settings wizard** link in the **IP-tv** section (for the detailed description of the Wizard, see the ***IPTV Settings Wizard*** section, page 80).

To configure all parameters of the router independently without the Wizards, click the **Advanced settings** link in the bottom right corner of the page.

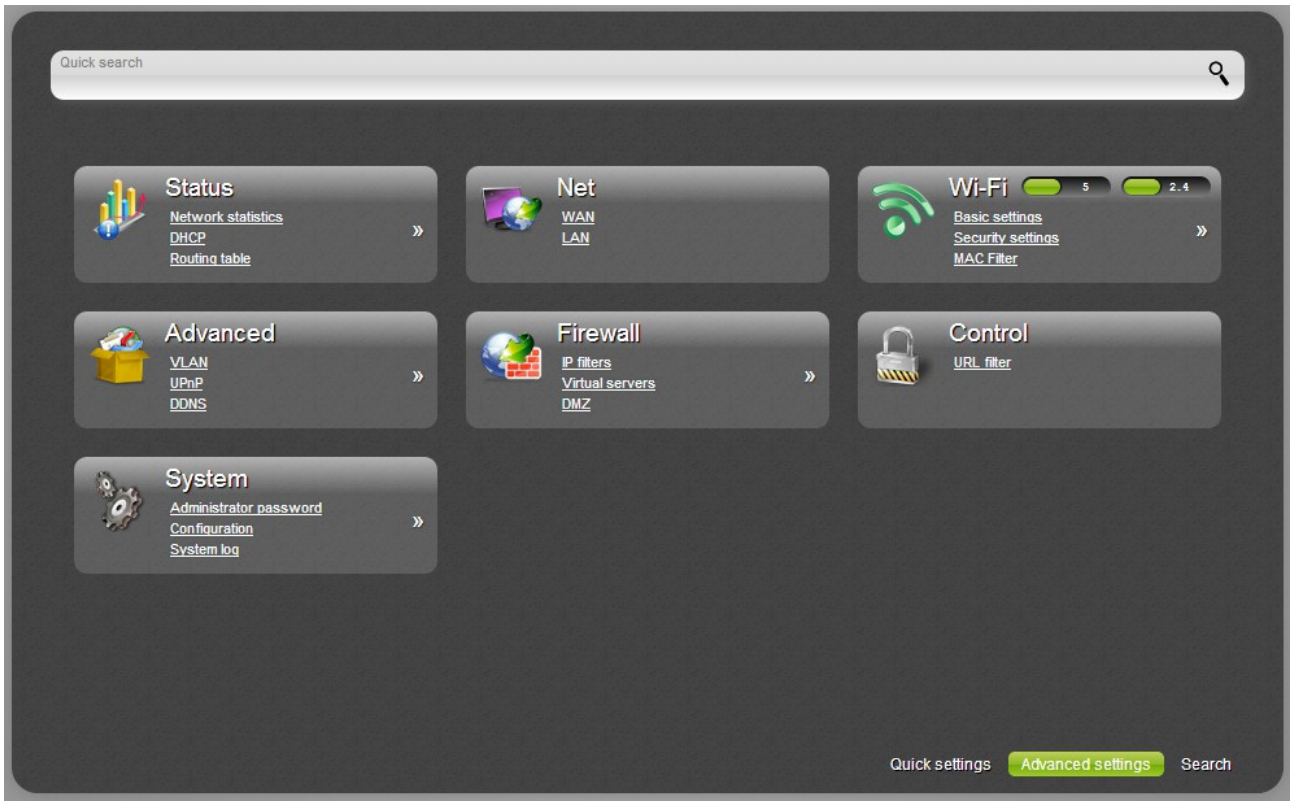

Figure 21. The advanced settings page.

The pages of the **Status** section display data on the current state of the router (for the description of the pages, see the ***Status*** section, page 81).

The pages of the **Net** section are designed for configuring basic parameters of the LAN interface of the router and creating a connection to the Internet (for the description of the pages, see the ***Net*** section, page 85).

The pages of the **Wi-Fi** section are designed for specifying all needed settings of the router's wireless network (for the description of the pages, see the ***Wi-Fi*** section, page 109). Also you can enable or disable one or both band the device's WLAN directly from the advanced settings page. To disable one the WLAN bands, select the **Off** position ( ) of the relevant **Enable/Disable Wi-Fi** switch. To enable one of the WLAN bands, select the **On** position ( ) of the relevant **Enable/Disable Wi-Fi** switch.

The pages of the **Advanced** section are designed for configuring additional parameters of the router (for the description of the pages, see the ***Advanced*** section, page 132).

The pages of the **Firewall** section are designed for configuring the firewall of the router (for the description of the pages, see the ***Firewall*** section, page 147).

The pages of the **Control** section are designed for creating restrictions on access to the Internet (for the description of the page, see the ***Control*** section, page 156).

The pages of the **System** section provide functions for managing the internal system of the router (for the description of the pages, see the ***System*** section, page 158).

Also you can find a specific page via search. To do this, enter the name of the page, wholly or partly, in the search bar in the top part of the web-based interface page, and then select a needed link in the search results.

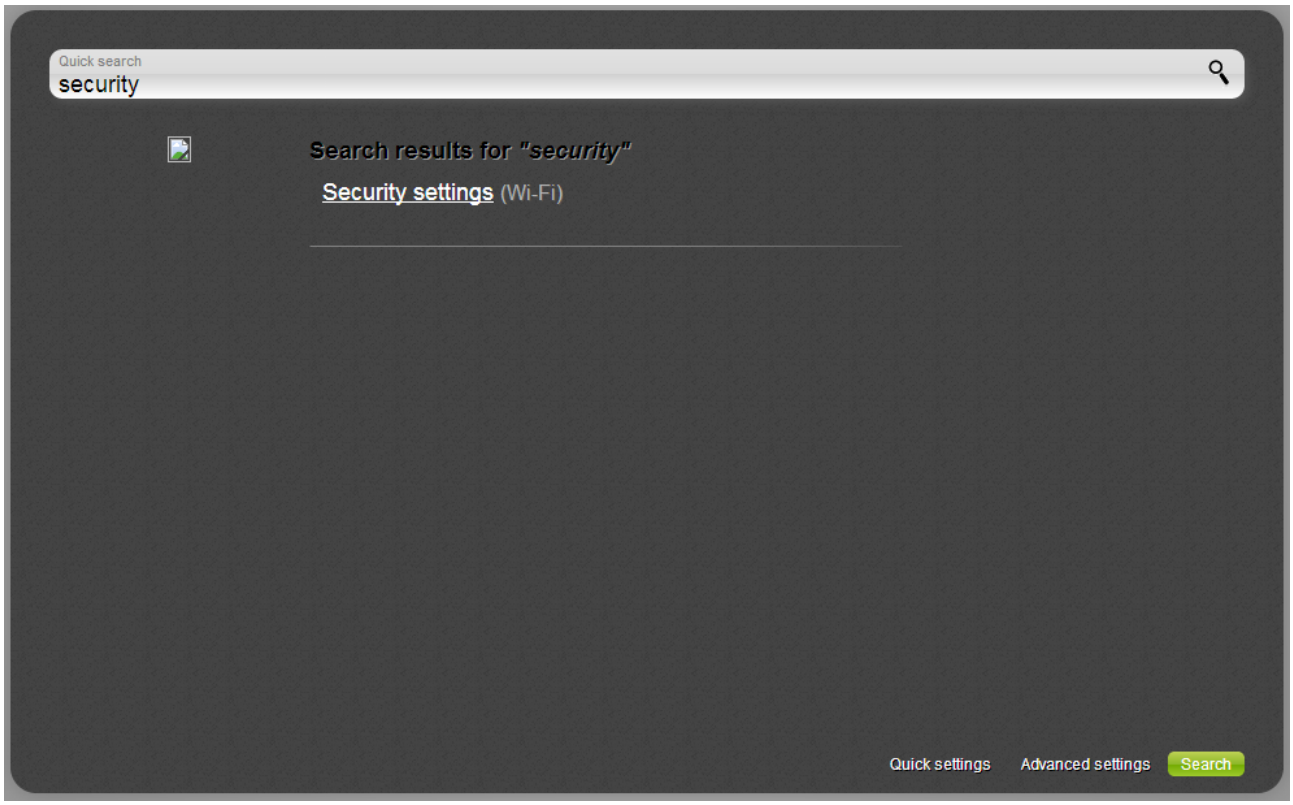

Figure 22. The page displaying the search results.

Saving and Restoring Settings

! Note that you should regularly save the changes of the router's settings to the non-volatile memory.

The router's web-based interface displays the notification on unsaved changes at the top of the page.

Figure 23. The notification on unsaved changes.

Place the mouse pointer on the **Notifications** icon ( ) to view the list of unsaved changes and click the relevant link.

You can save the router's settings via the top-page menu displayed when the mouse pointer is over the **System** caption.

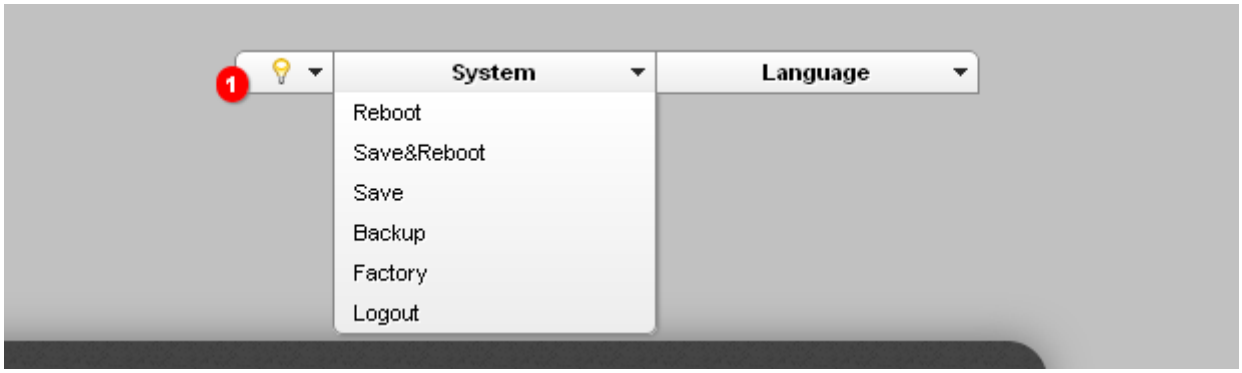

Figure 24. The top-page menu.

Click the **Reboot** line if you have already saved the router's settings.

Click the **Save&Reboot** line to save new settings and immediately reboot the router.

Click the **Save** line to save new settings to the non-volatile memory and continue configuring the device. Also you can save the device's parameters via the **Save** button on the **System / Configuration** page.

Click the **Backup** line and follow the dialog box appeared to save the configuration (all settings of the router) to your PC. Also you can save the router's configuration to your PC via the **Backup** button on the **System / Configuration** page.

Click the **Factory** line to restore the factory default settings. Also you can restore the factory defaults via the **Factory** button on the **System / Configuration** page.

Also you can restore the factory default settings via the hardware **RESET** button. The button is located on the back panel of the router.

To restore the factory default settings, insert a small paperclip into the hole of the button (with the router **powered on**), push, and hold for 7 seconds.

Wait for about 30 seconds. Now you can access the web-based interface of the router using the default IP address, username and password.

When you have configured all needed settings, click the **Logout** line.

CHAPTER 4. CONFIGURING VIA WEB-BASED INTERFACE

Click'n'Connect

To configure connection to the Internet, click the **Click'n'Connect** link in the **Net** section.

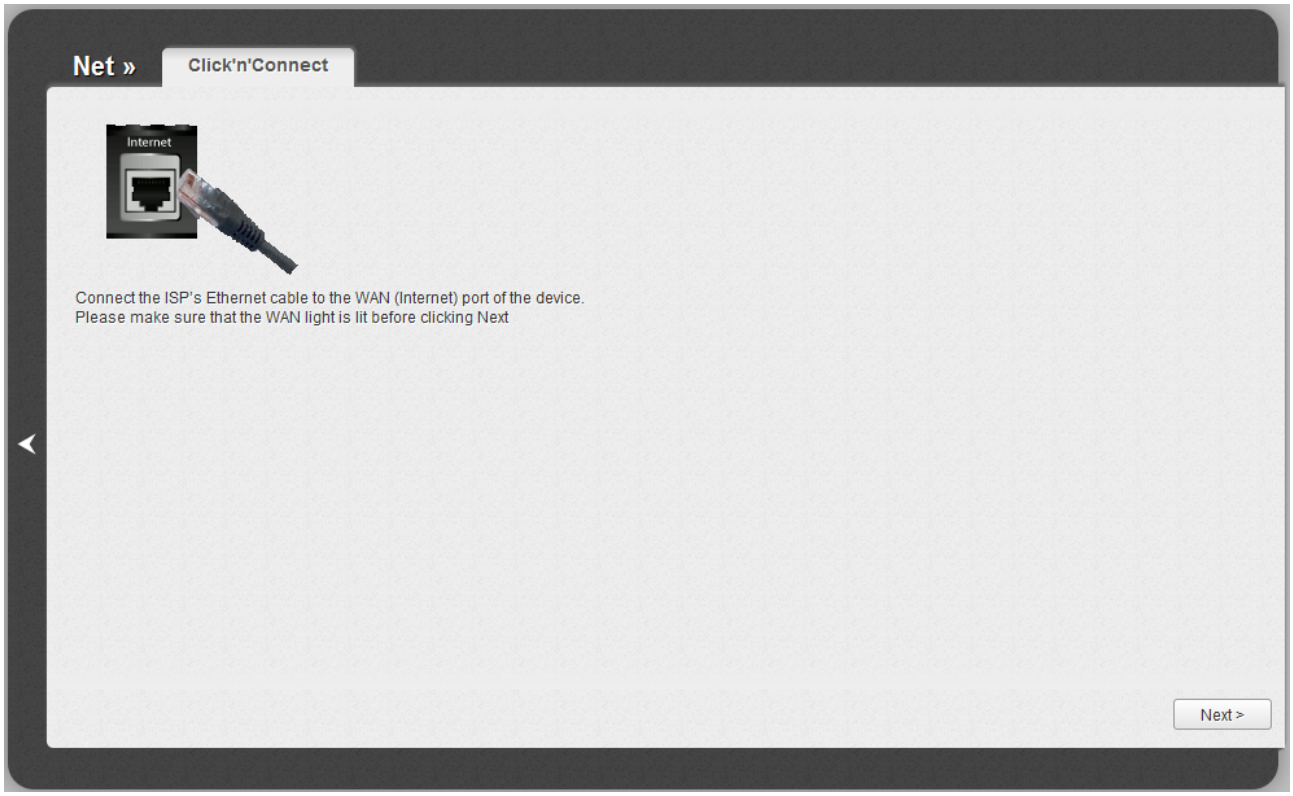
Net »
Click'n'Connect
Internet
Connect the ISP's Ethernet cable to the WAN (Internet) port of the device.
Please make sure that the WAN light is lit before clicking Next
Next >

Figure 25. Configuring a WAN connection.

Connect the Ethernet cable provided by your ISP to the WAN port of the router. Verify the relevant LED (the **INTERNET** LED should be on).

Click the **Next** button to continue.

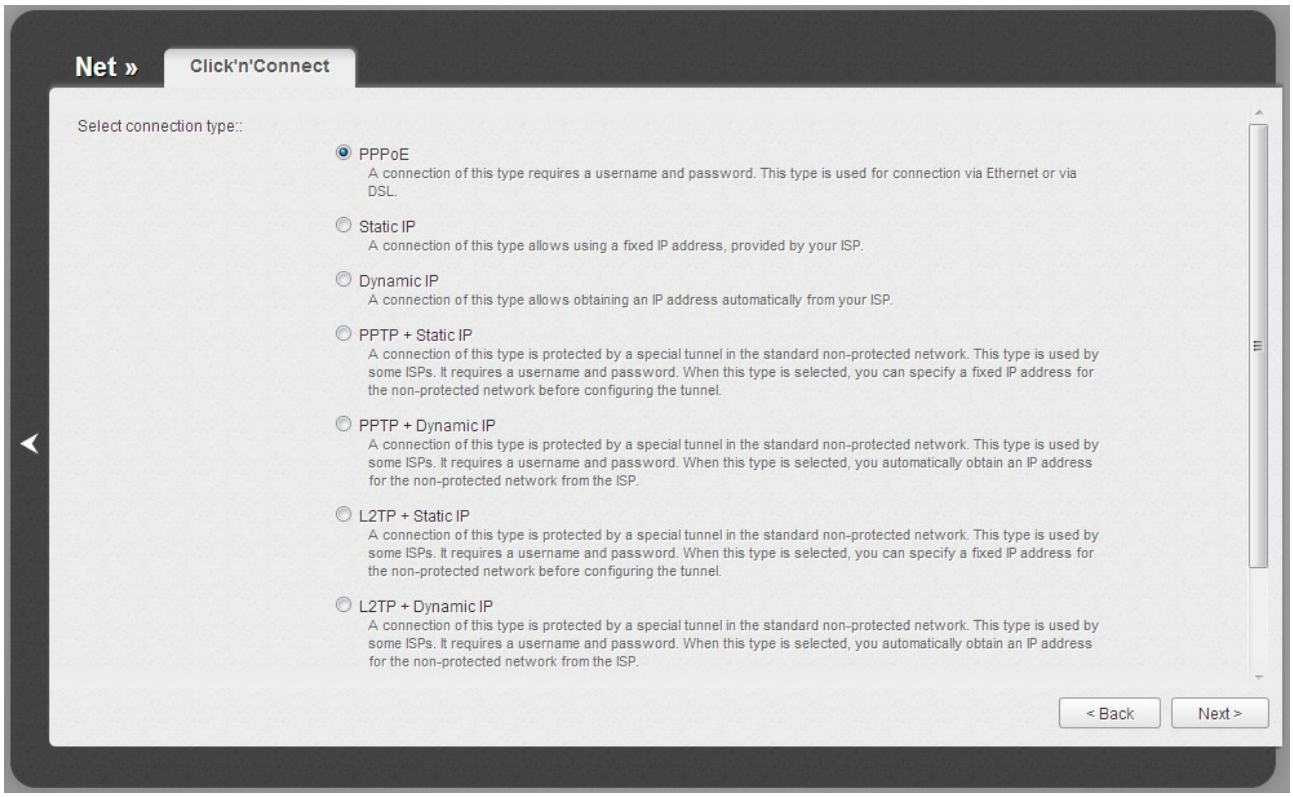
Net »
Click'n'Connect
Select connection type::
PPPoE
A connection of this type requires a username and password. This type is used for connection via Ethernet or via DSL.
Static IP
A connection of this type allows using a fixed IP address, provided by your ISP.
Dynamic IP
A connection of this type allows obtaining an IP address automatically from your ISP.
PPTP + Static IP
A connection of this type is protected by a special tunnel in the standard non-protected network. This type is used by some ISPs. It requires a username and password. When this type is selected, you can specify a fixed IP address for the non-protected network before configuring the tunnel.
PPTP + Dynamic IP
A connection of this type is protected by a special tunnel in the standard non-protected network. This type is used by some ISPs. It requires a username and password. When this type is selected, you automatically obtain an IP address for the non-protected network from the ISP.
L2TP + Static IP
A connection of this type is protected by a special tunnel in the standard non-protected network. This type is used by some ISPs. It requires a username and password. When this type is selected, you can specify a fixed IP address for the non-protected network before configuring the tunnel.
L2TP + Dynamic IP
A connection of this type is protected by a special tunnel in the standard non-protected network. This type is used by some ISPs. It requires a username and password. When this type is selected, you automatically obtain an IP address for the non-protected network from the ISP.
< Back
Next >

Figure 26. The page for selecting the connection type.

On the opened page, select the needed choice of the radio button and click the **Next** button.

Creating WAN Connection

PPPoE Connection

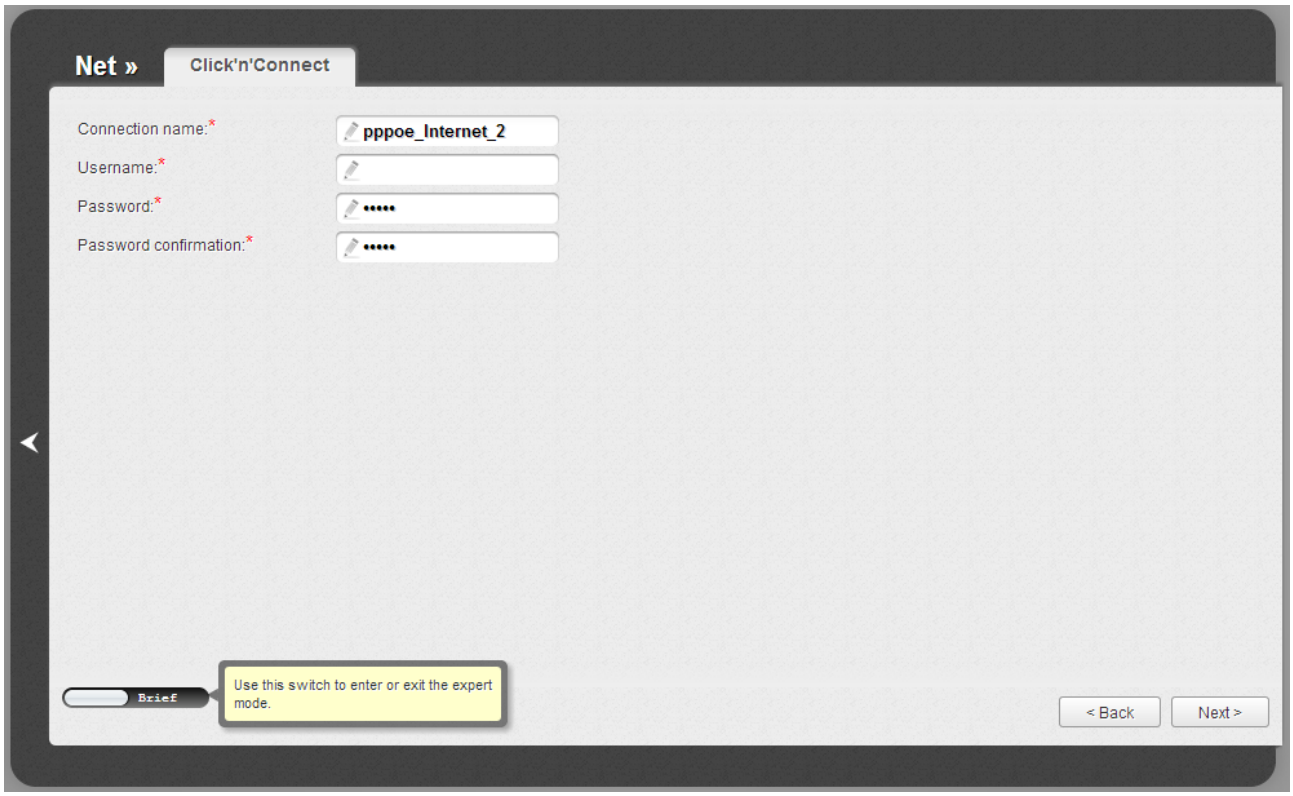

Figure 27. Configuring PPPoE WAN connection.

In the **Connection name** field, specify a name for the connection for easier identification.

In the **Username** field, enter your login, and in the **Password** and **Password confirmation** fields – the password provided by your ISP.

As a rule, the specified settings are enough to configure a connection of the selected type. If you need to specify additional settings, open the expert settings mode. To do this, use the switch in the bottom left corner of the page.

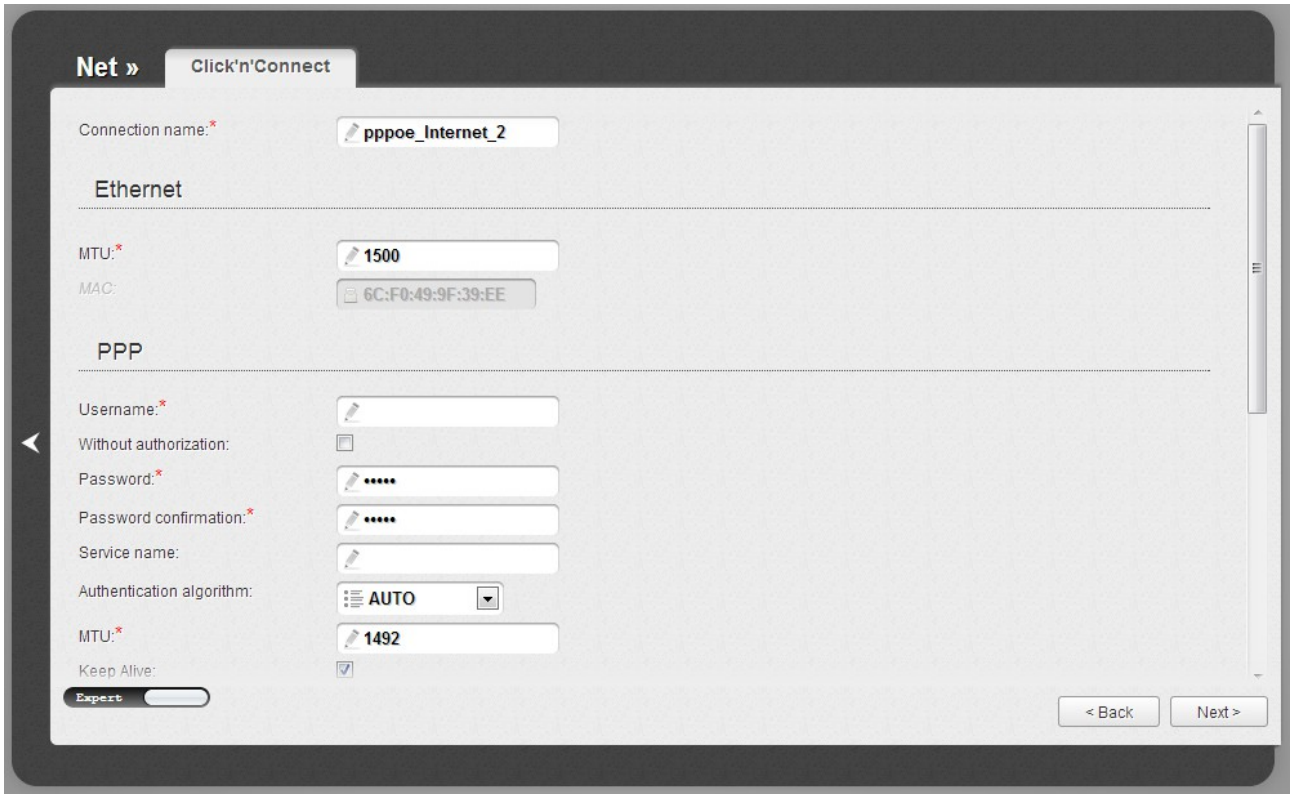

*Figure 28. Configuring PPPoE WAN connection. The expert settings mode. The **Ethernet** section.*

Parameter	Description
Connection name	A name for connection for easier identification.
Ethernet	
MTU	The maximum size of units transmitted by the interface.
MAC	A MAC address of the router's WAN interface. If you need to assign another MAC address to this connection, then after completing the Wizard proceed to the **Net / WAN** page, select the newly created connection, and change it as needed.

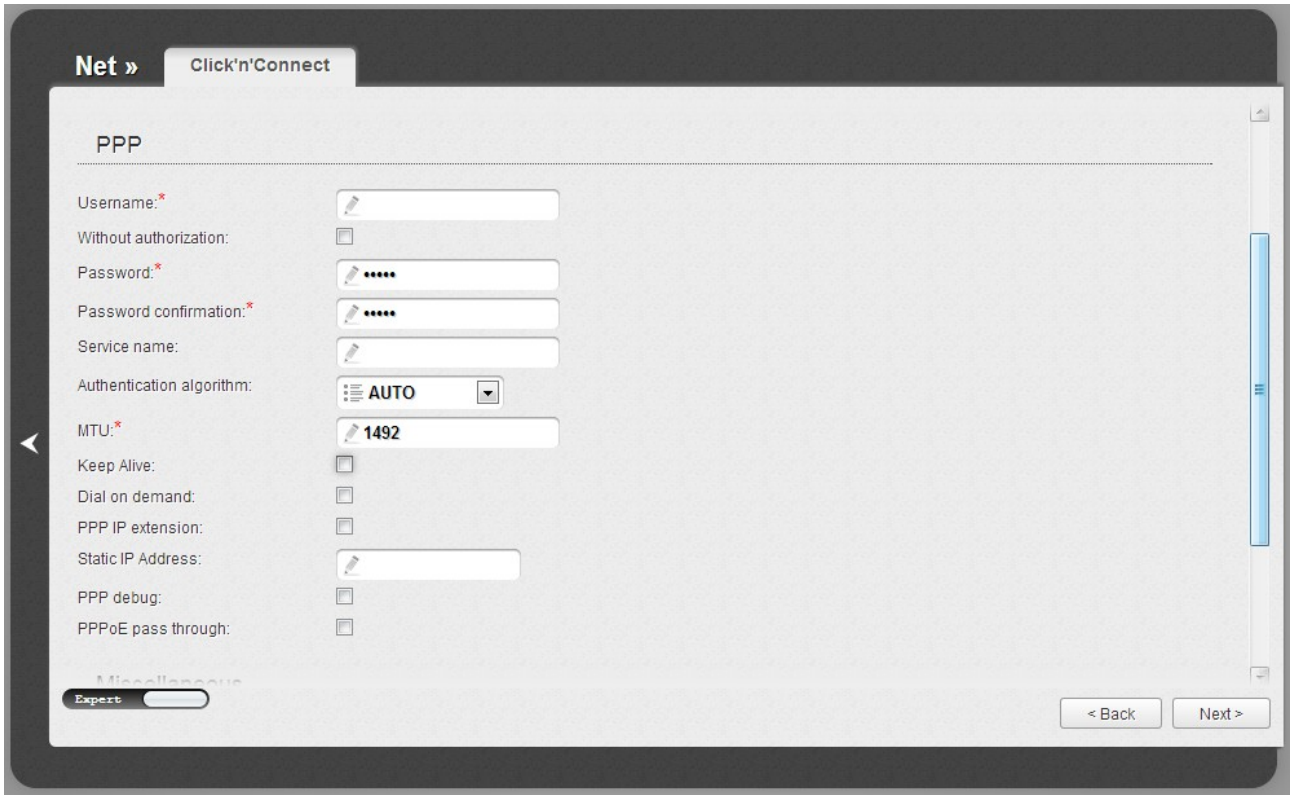

*Figure 29. Configuring PPPoE WAN connection. The expert settings mode. The **PPP** section.*

Parameter	Description
PPP	
Username	A username (login) to access the Internet.
Without authorization	Select the checkbox if you don't need to enter a username and password to access the Internet.
Password	A password to access the Internet.
Password confirmation	The confirmation of the entered password (to avoid mistypes).
Service name	The name of the PPPoE authentication server.
Authentication algorithm	Select a required authentication method from the drop-down list or leave the **AUTO** value.
MTU	The maximum size of units transmitted by the interface.
Keep Alive	Select the checkbox if you want the router to keep you connected to your ISP even when the connection has been inactive for a specified period of time. When the checkbox is selected, the **LCP interval** and **LCP fails** fields are available. Specify the required values.

Parameter	Description
Dial on demand	Select the checkbox if you want the router to establish connection to the Internet on demand. In the **Maximum idle time** field, specify a period of inactivity (in seconds) after which the connection should be terminated.
PPP IP extension	This option is used by some ISPs. Contact your ISP to clarify if this checkbox needs to be enabled.
Static IP Address	Fill in the field if you want to use a static IP address to access the Internet.
PPP debug	Select the checkbox if you want to log all data on PPP connection debugging.
PPPoE pass through	Select the checkbox if you want to allow PPPoE clients of computers from your LAN to connect to the Internet through this PPPoE connection of the router.

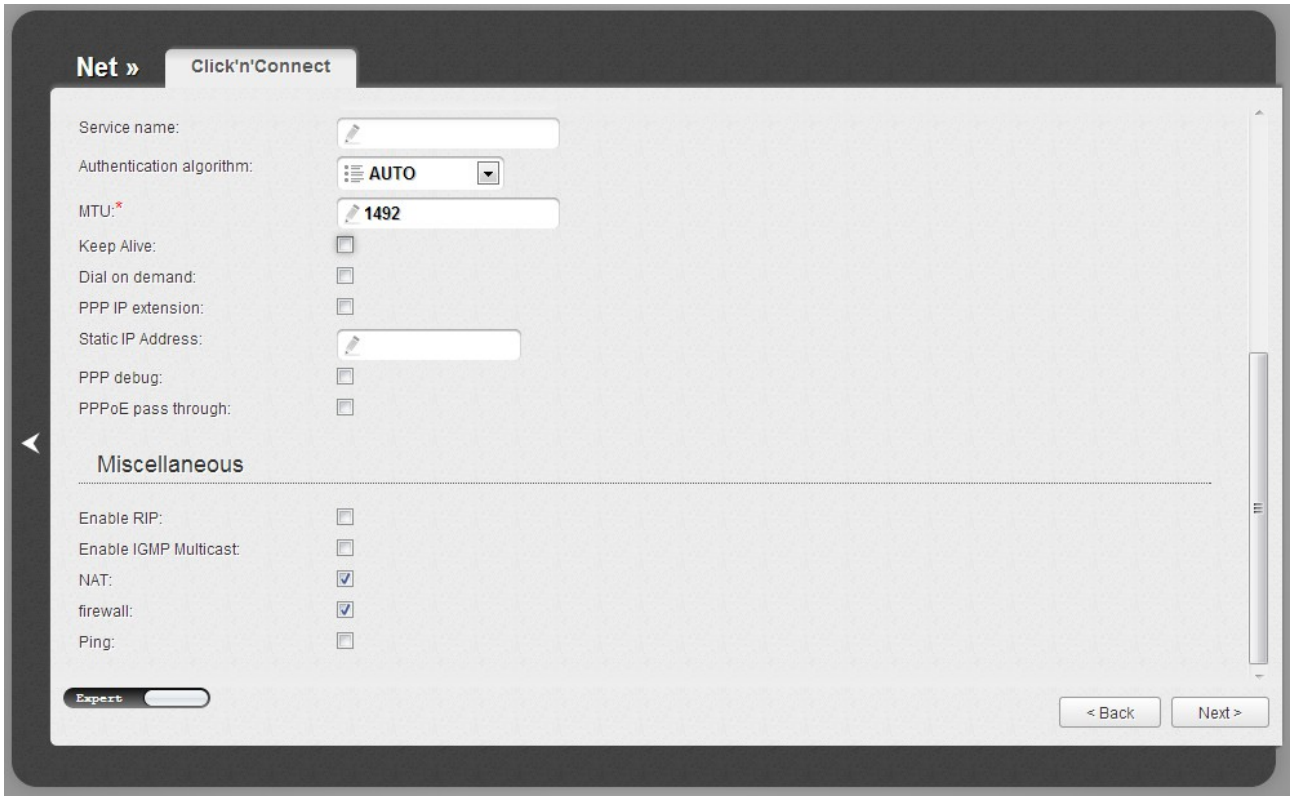

*Figure 30. Configuring PPPoE WAN connection. The expert settings mode. The **Miscellaneous** section.*

Parameter	Description
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
Enable IGMP Multicast	Select the checkbox to allow multicast traffic from the external network (e.g. video streaming) to be received.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

Click the **Next** button to continue.

After that the page displaying all specified settings opens. Click the **Apply** button to create the connection or the **Back** button to specify other settings.

After clicking the **Apply** button, the page for checking the Internet availability opens (see the ***Checking Internet Availability*** section, page 66).

Static IP Connection

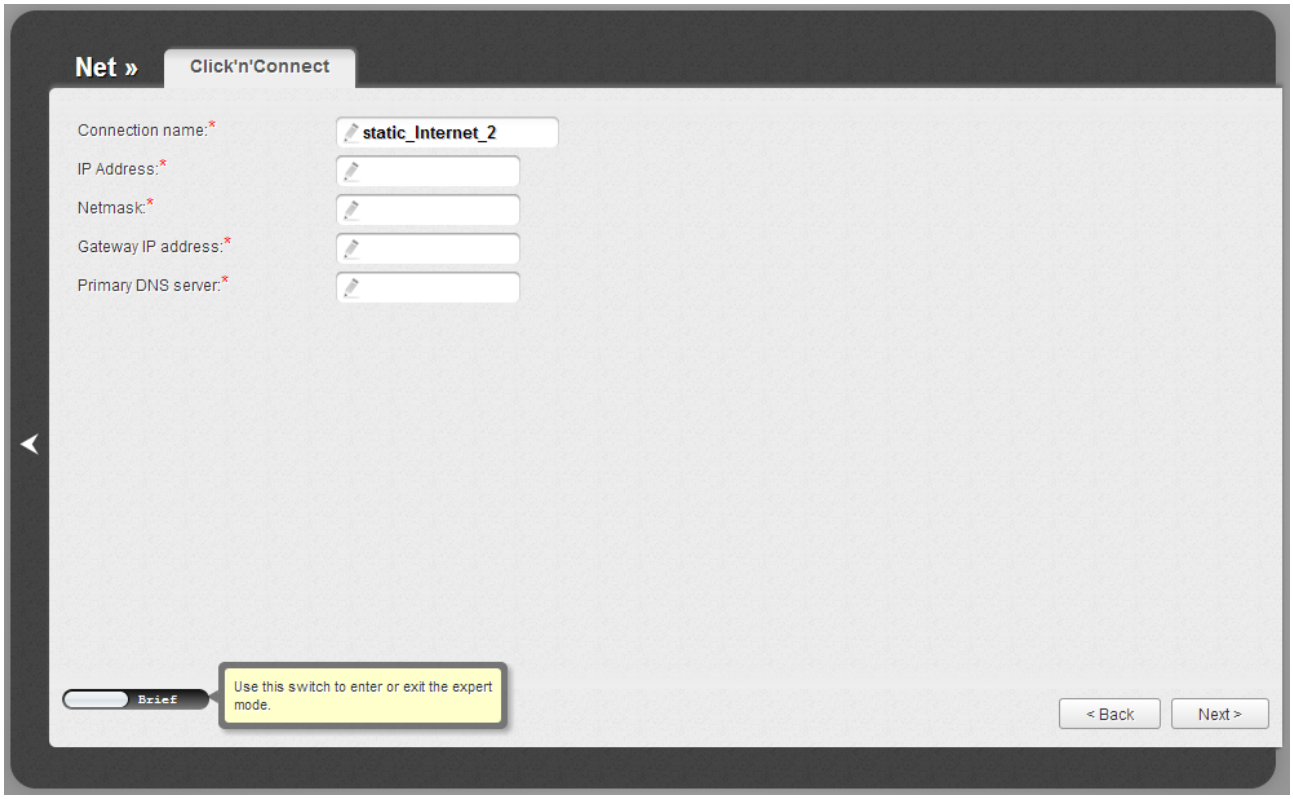

Figure 31. Configuring Static IP WAN connection.

In the **Connection name** field, specify a name for the connection for easier identification.

Fill in the **IP Address** and **Netmask** fields.

In the **Gateway IP address** field, enter the IP address of the gateway used by this WAN connection.

In the **Primary DNS server** field, enter the address of the primary DNS server.

As a rule, the specified settings are enough to configure a connection of the selected type. If you need to specify additional settings, open the expert settings mode. To do this, use the switch in the bottom left corner of the page.

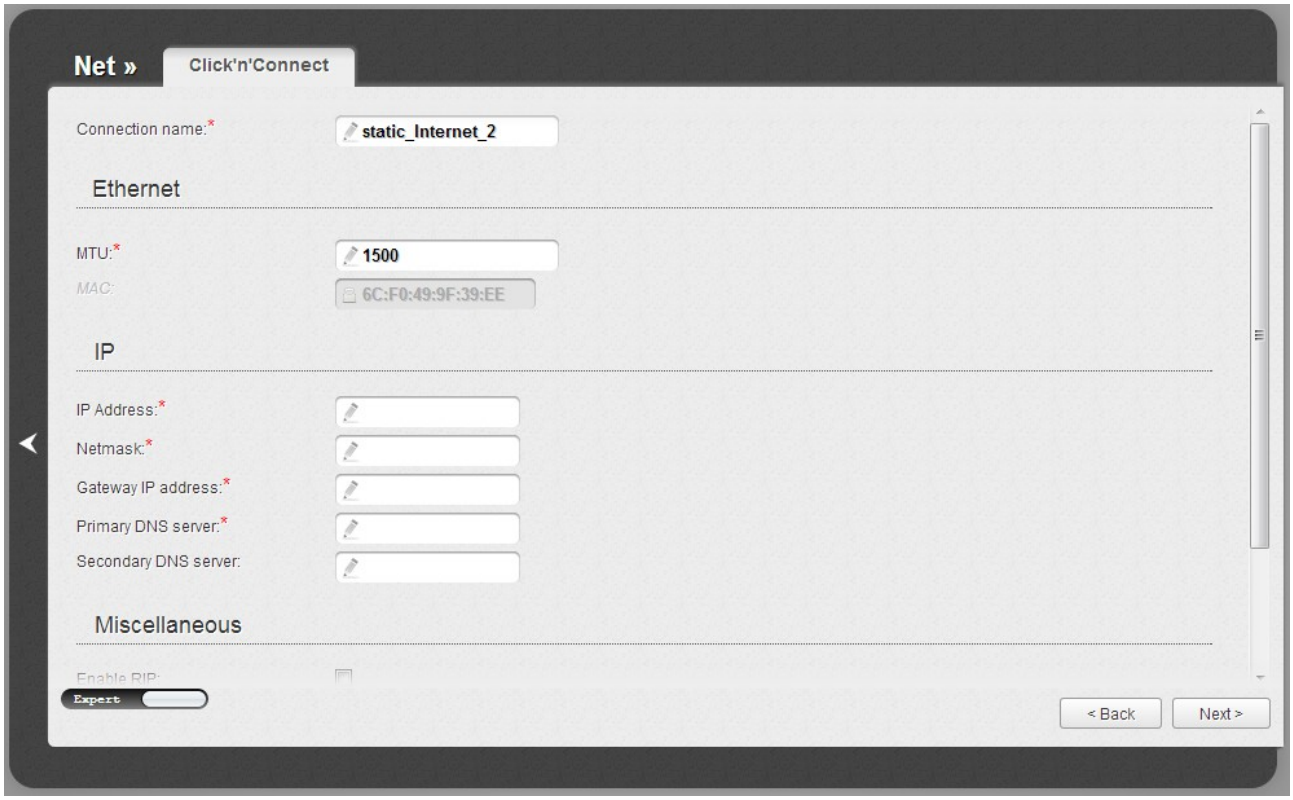

*Figure 32. Configuring Static IP WAN connection. The expert settings mode. The **Ethernet** section.*

Parameter	Description
Connection name	A name for connection for easier identification.
Ethernet	
MTU	The maximum size of units transmitted by the interface.
MAC	A MAC address of the router's WAN interface. If you need to assign another MAC address to this connection, then after completing the Wizard proceed to the **Net / WAN** page, select the newly created connection, and change it as needed.

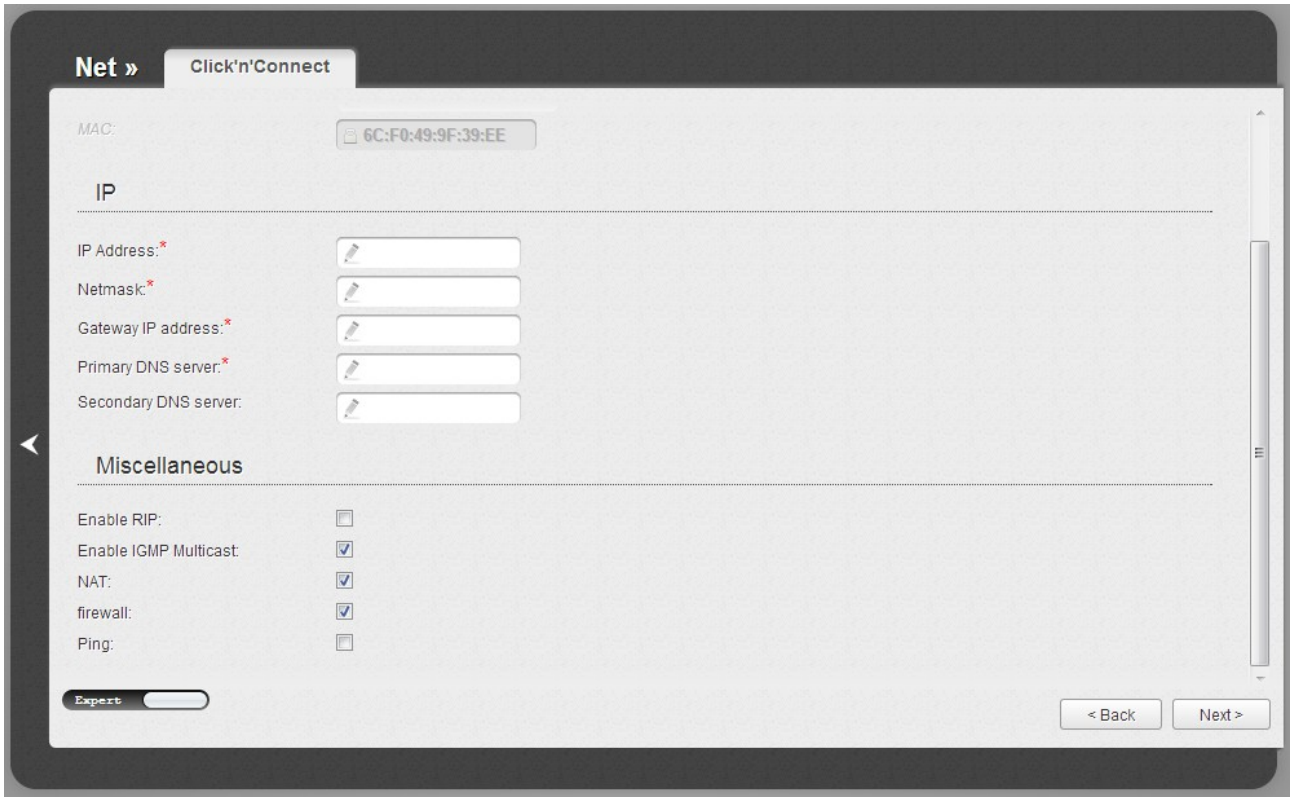

*Figure 33. Configuring Static IP WAN connection. The expert settings mode. The **IP** and **Miscellaneous** sections.*

Parameter	Description
IP	
IP Address	Enter an IP address for this WAN connection.
Netmask	Enter a subnet mask for this WAN connection.
Gateway IP address	Enter an IP address of the gateway used by this WAN connection.
Primary DNS server/ Secondary DNS server	Enter addresses of the primary and secondary DNS servers in the relevant fields.
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
Enable IGMP Multicast	Select the checkbox to allow multicast traffic from the external network (e.g. video streaming) to be received.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.

Parameter	Description
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

Click the **Next** button to continue.

After that the page displaying all specified settings opens. Click the **Apply** button to create the connection or the **Back** button to specify other settings.

After clicking the **Apply** button, the page for checking the Internet availability opens (see the ***Checking Internet Availability*** section, page 66).

Dynamic IP Connection

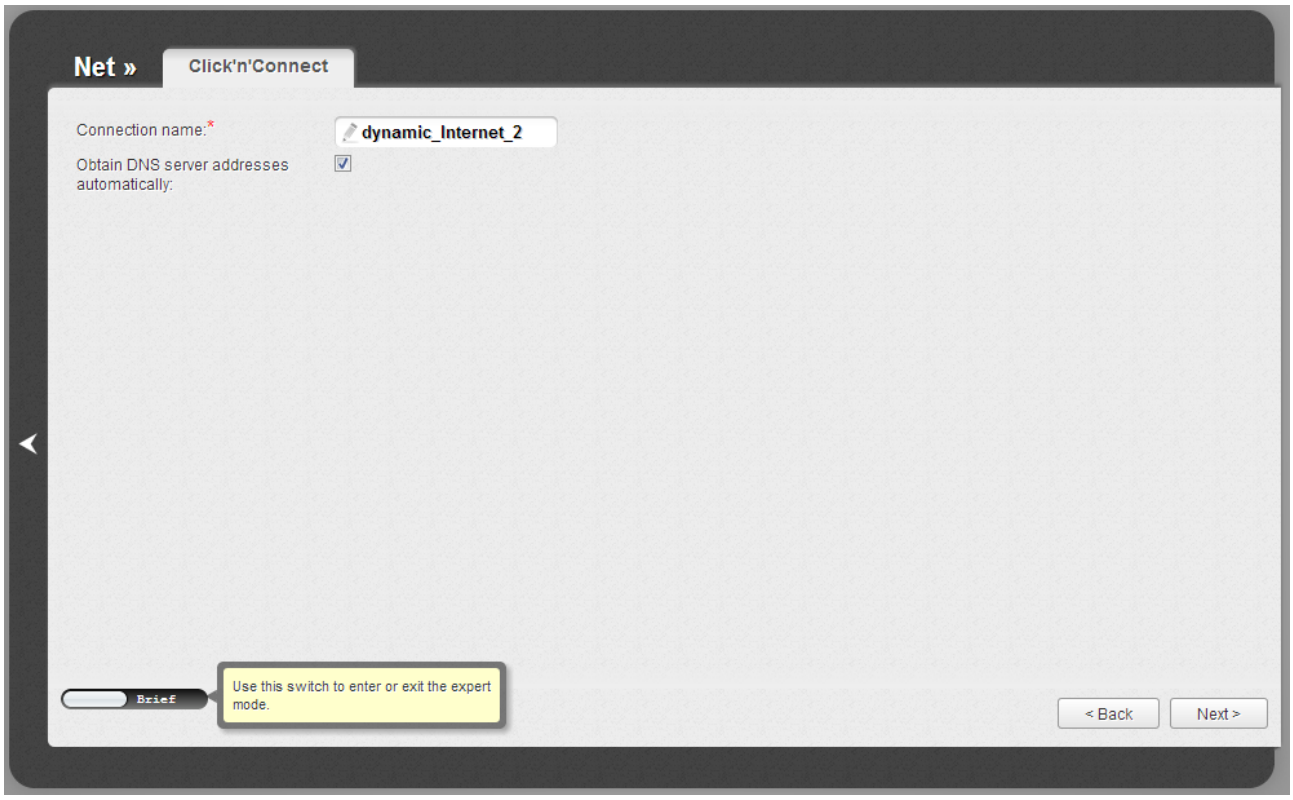

Figure 34. Configuring Dynamic IP WAN connection.

In the **Connection name** field, specify a name for the connection for easier identification.

If your ISP has provided the addresses of the DNS servers, deselect the **Obtain DNS server addresses automatically** checkbox and fill in the **Primary DNS server** field.

As a rule, the specified settings are enough to configure a connection of the selected type. If you need to specify additional settings, open the expert settings mode. To do this, use the switch in the bottom left corner of the page.

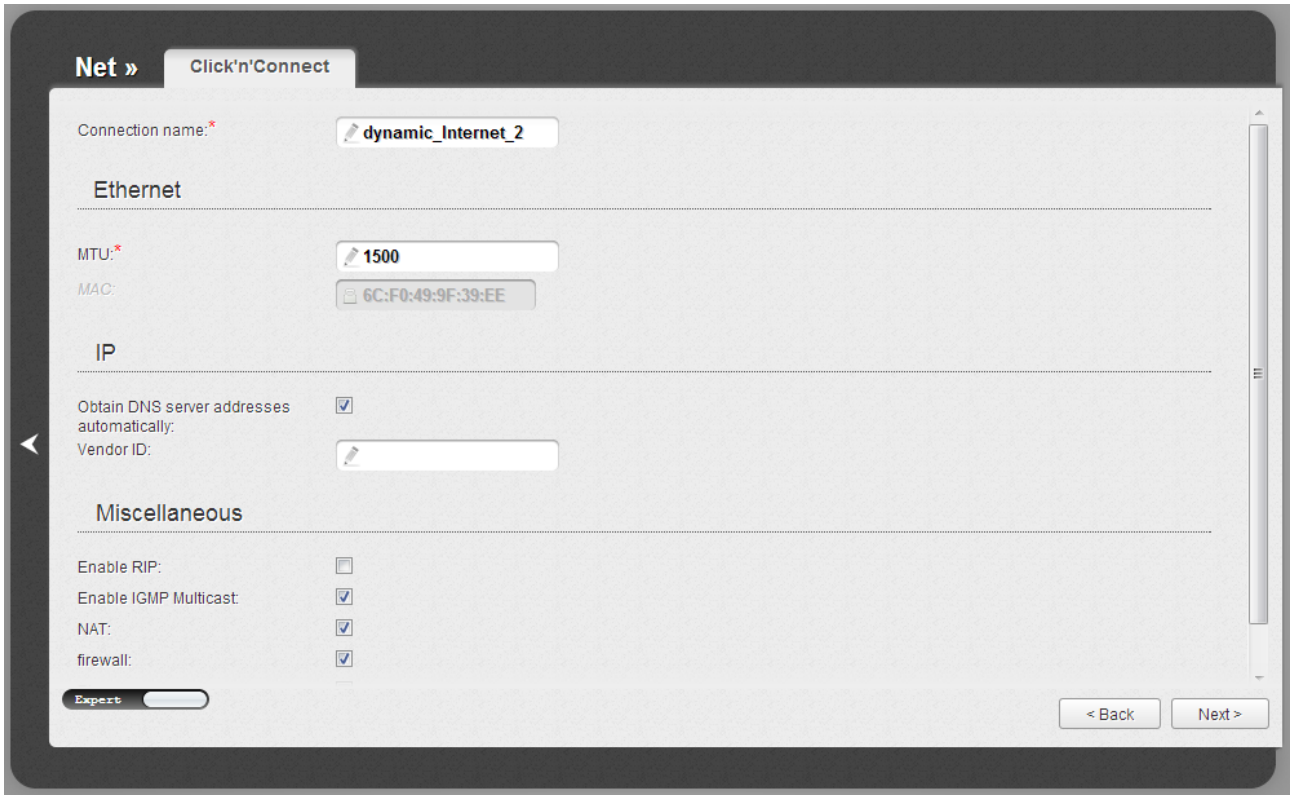

*Figure 35. Configuring Dynamic IP WAN connection. The expert settings mode. The **Ethernet** section.*

Parameter	Description
Connection name	A name for connection for easier identification.
Ethernet	
MTU	The maximum size of units transmitted by the interface.
MAC	A MAC address of the router's WAN interface. If you need to assign another MAC address to this connection, then after completing the Wizard proceed to the **Net / WAN** page, select the newly created connection, and change it as needed.

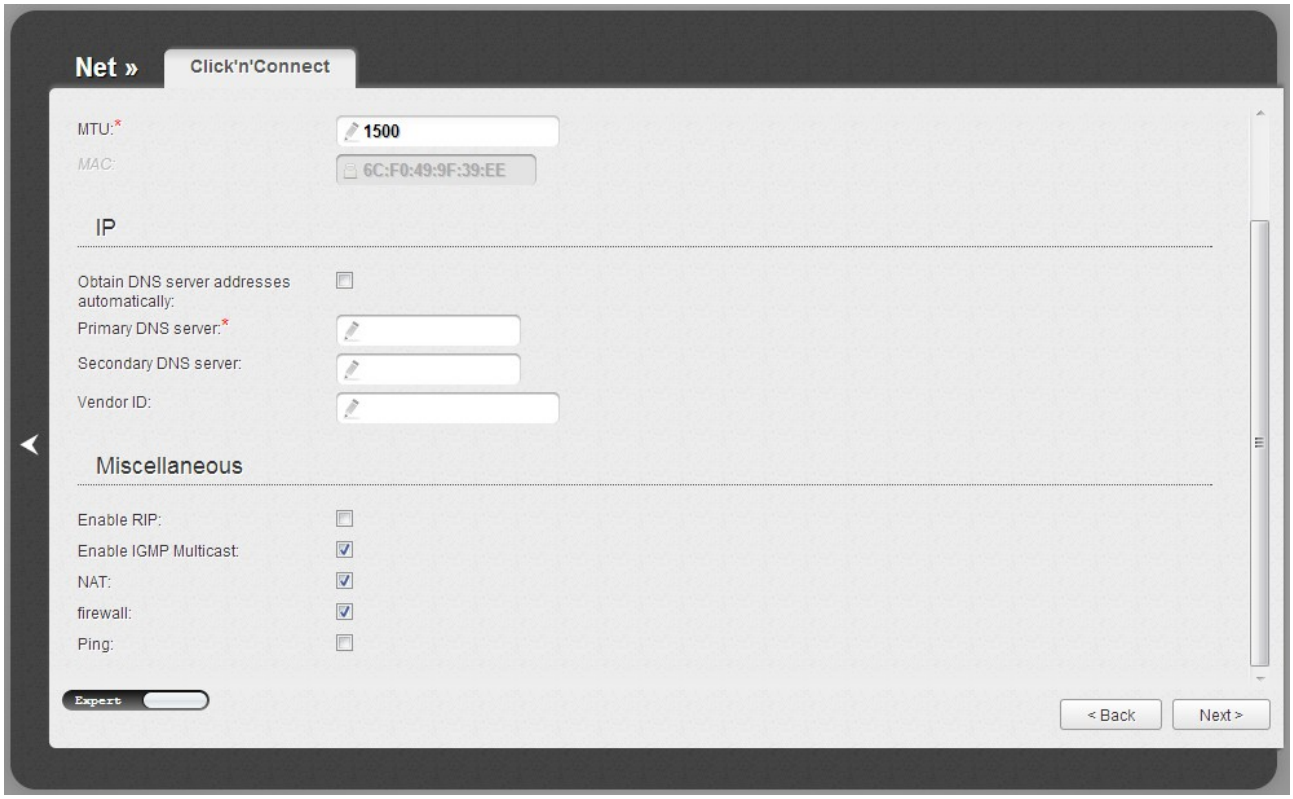

*Figure 36. Configuring Dynamic IP WAN connection. The expert settings mode. The **IP** and **Miscellaneous** sections.*

Parameter	Description
IP	
Obtain DNS server addresses automatically	Select the checkbox to configure automatic assignment of DNS server addresses. If the checkbox is selected, the **Primary DNS server** and **Secondary DNS server** fields are not displayed.
Primary DNS server/ Secondary DNS server	Enter addresses of the primary and secondary DNS servers in the relevant fields.
Vendor ID	The identifier of your ISP. *Optional*.
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
Enable IGMP Multicast	Select the checkbox to allow multicast traffic from the external network (e.g. video streaming) to be received.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.

Parameter	Description
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

Click the **Next** button to continue.

After that the page displaying all specified settings opens. Click the **Apply** button to create the connection or the **Back** button to specify other settings.

After clicking the **Apply** button, the page for checking the Internet availability opens (see the ***Checking Internet Availability*** section, page 66).

PPTP + Static IP or L2TP + Static IP Connection

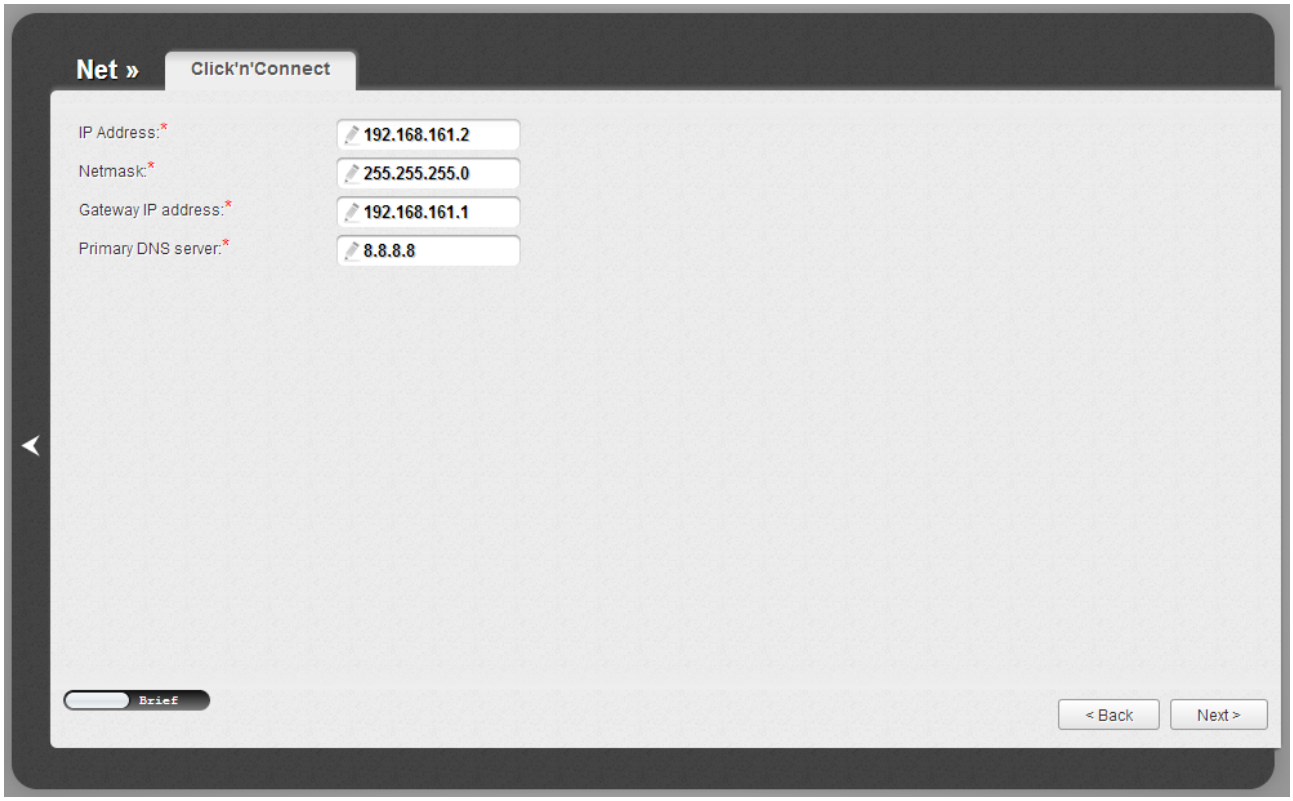

Figure 37. Configuring PPTP + Static IP WAN connection.

Fill in the **IP Address** and **Netmask** fields.

In the **Gateway IP address** field, enter the IP address of the gateway used by this WAN connection.

In the **Primary DNS server** field, enter the address of the primary DNS server.

As a rule, the specified settings are enough to configure a non-protected connection of the selected type. If you need to specify additional settings, open the expert settings mode. To do this, use the switch in the bottom left corner of the page.

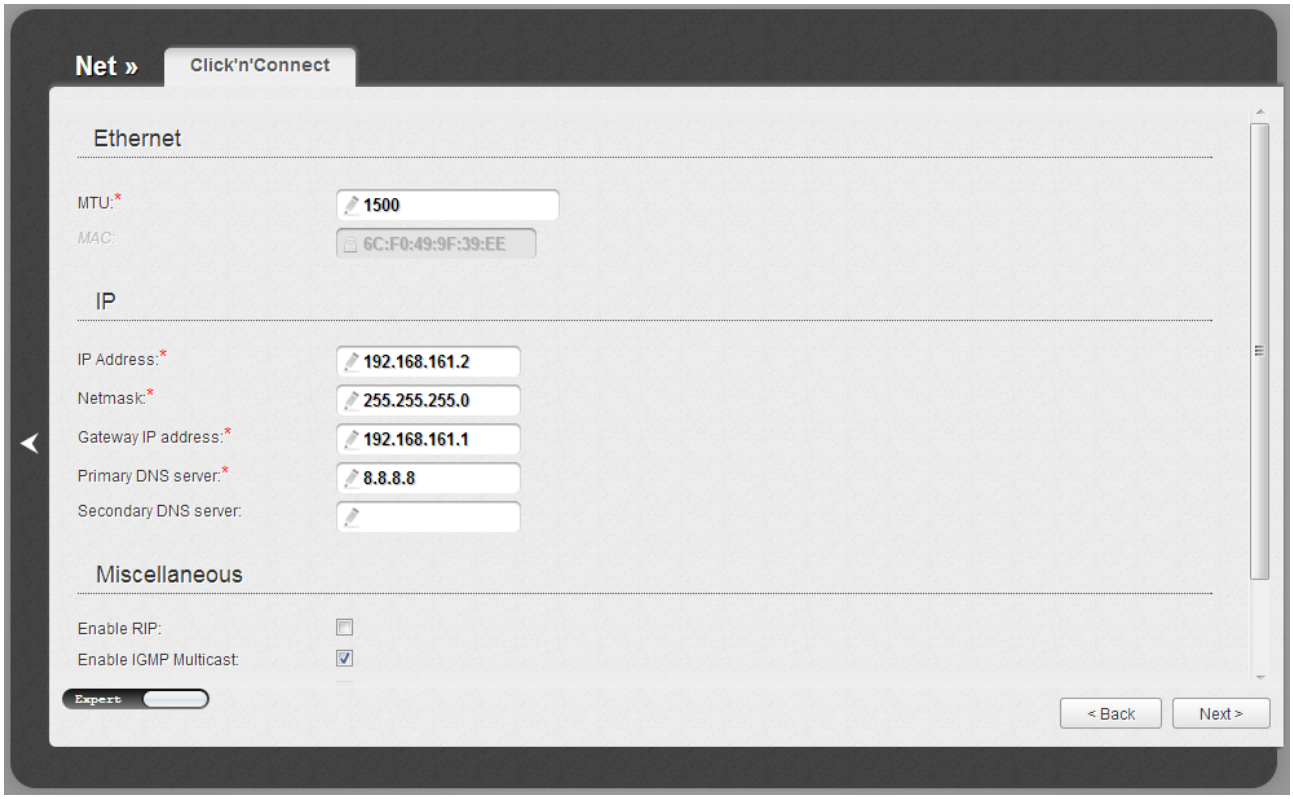

*Figure 38. Configuring PPTP + Static IP WAN connection. The expert settings mode. The **Ethernet** section.*

Parameter	Description
Ethernet	
MTU	The maximum size of units transmitted by the interface.
MAC	A MAC address of the router's WAN interface. If you need to assign another MAC address to this connection, then after completing the Wizard proceed to the **Net / WAN** page, select the newly created connection, and change it as needed.

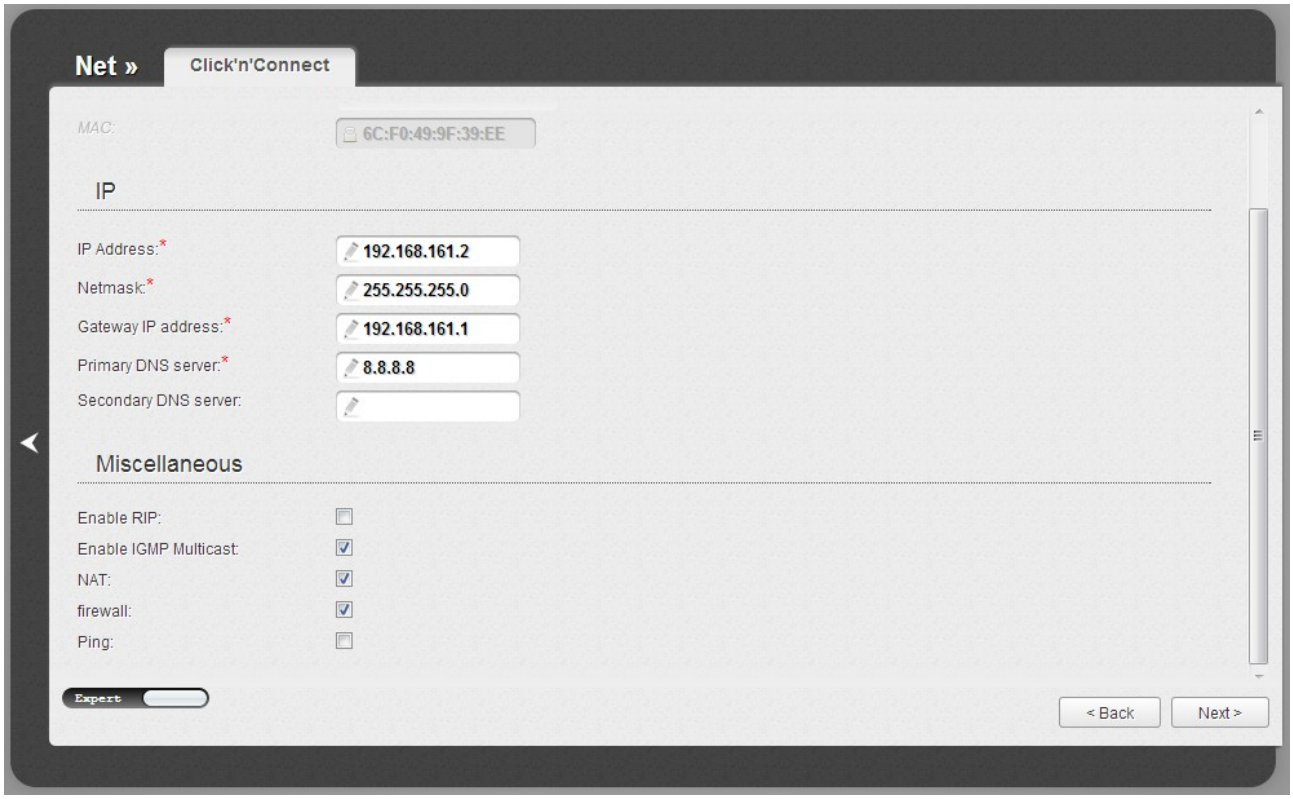

*Figure 39. Configuring PPTP + Static IP WAN connection. The expert settings mode. The **IP** and **Miscellaneous** sections.*

Parameter	Description
IP	
IP Address	Enter an IP address for this WAN connection.
Netmask	Enter a subnet mask for this WAN connection.
Gateway IP address	Enter an IP address of the gateway used by this WAN connection.
Primary DNS server/ Secondary DNS server	Enter addresses of the primary and secondary DNS servers in the relevant fields.
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
Enable IGMP Multicast	Select the checkbox to allow multicast traffic from the external network (e.g. video streaming) to be received.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.

Parameter	Description
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

Click the **Next** button to continue.

If needed, enter the IP addresses of the ISP's local resources.

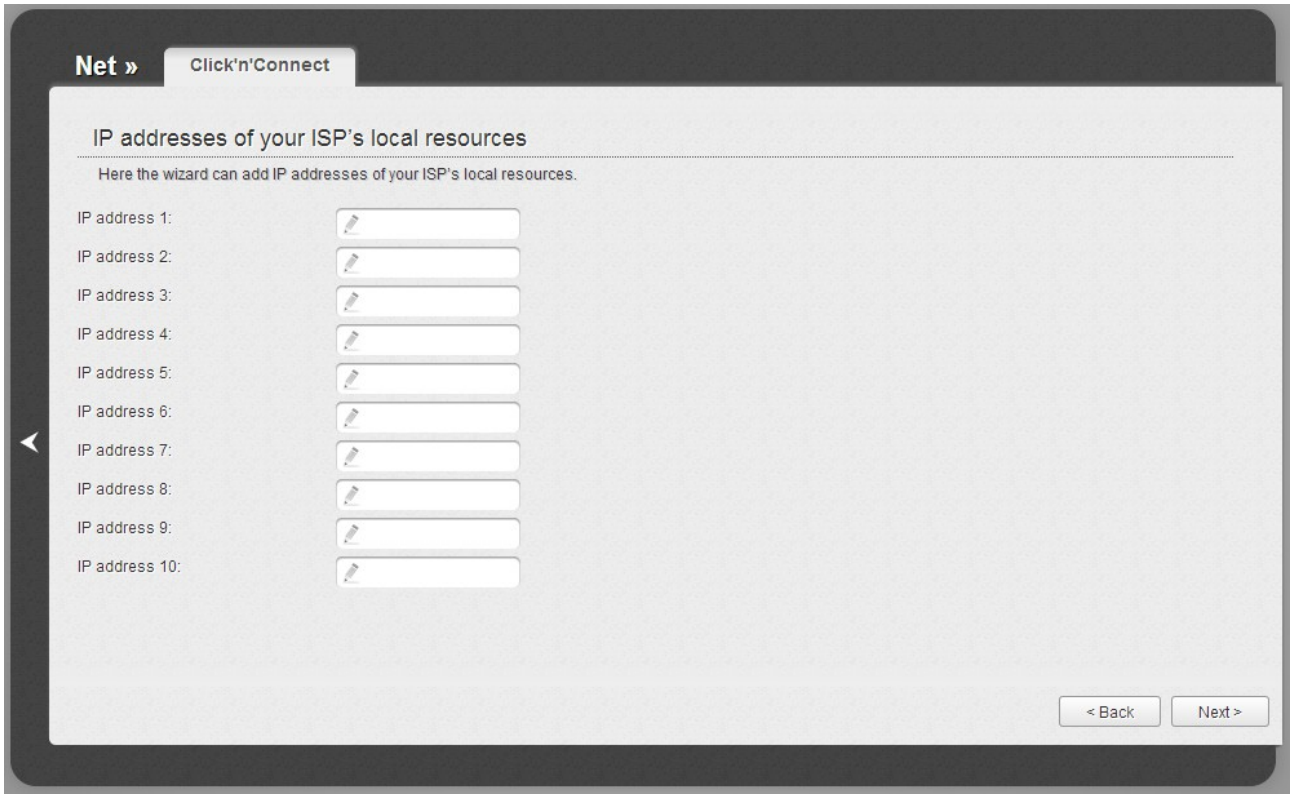

Figure 40. Configuring PPTP + Static IP WAN connection.

Click the **Next** button to continue.

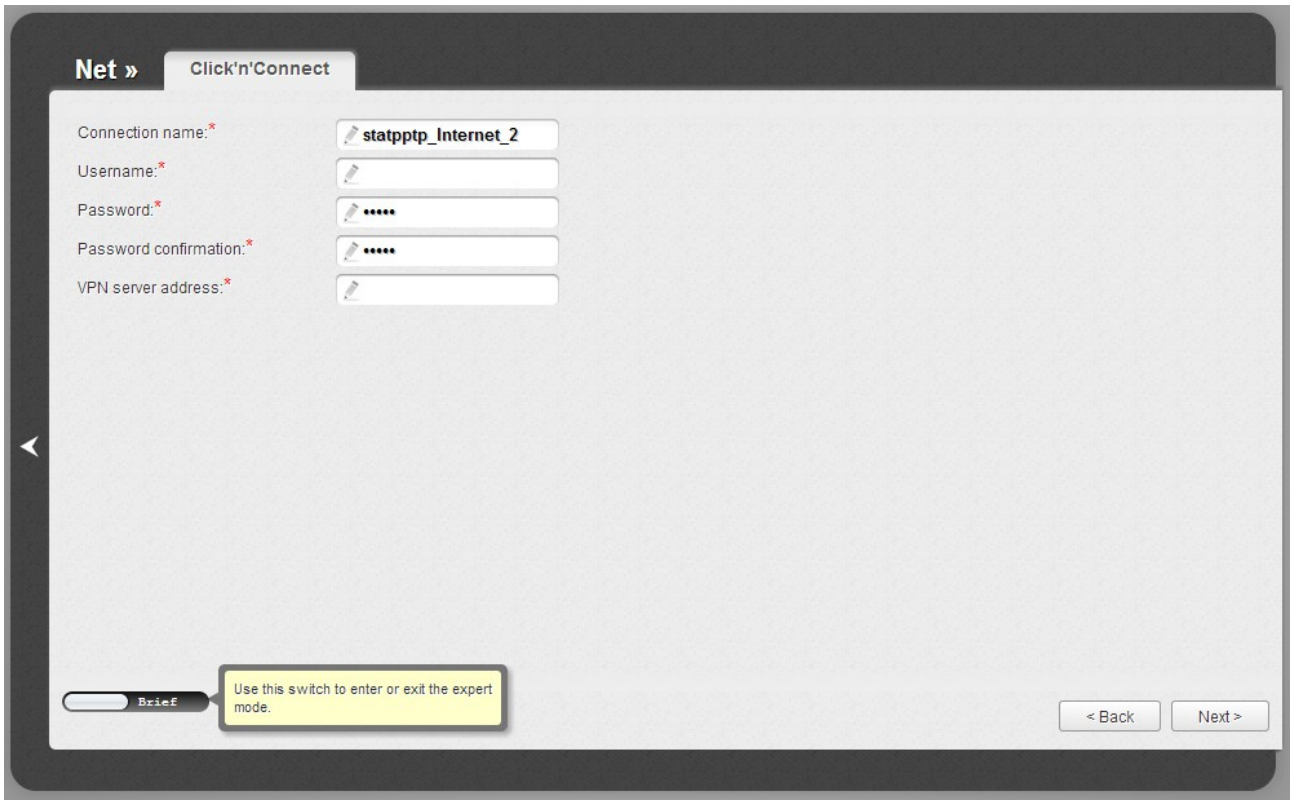

Figure 41. Configuring PPTP + Static IP WAN connection.

In the **Connection name** field, specify a name for the connection for easier identification.

In the **Username** field, enter your login, and in the **Password** and **Password confirmation** fields – the password provided by your ISP.

In the **VPN server address** field, enter the IP or URL address of the PPTP or L2TP authentication server.

As a rule, the specified settings are enough to configure a protected connection (the VPN tunnel). If you need to specify additional settings, open the expert settings mode. To do this, use the switch in the bottom left corner of the page.

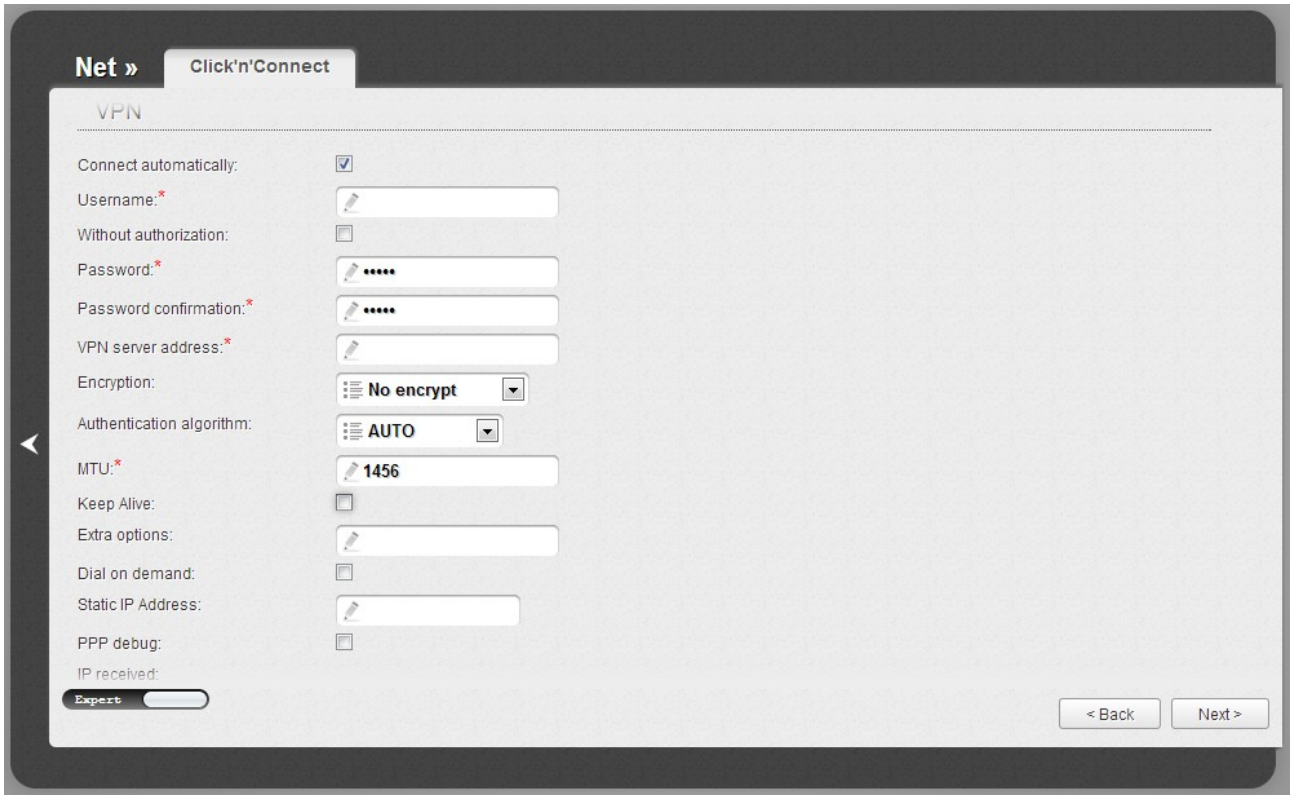

*Figure 42. Configuring PPTP + Static IP WAN connection. The expert settings mode. The **VPN** section.*

Parameter	Description
Connection name	A name for connection for easier identification.
VPN	
Connect automatically	Select the checkbox to enable auto-start of the connection upon the boot-up of the router.
Username	A username (login) to access the Internet.
Without authorization	Select the checkbox if you don't need to enter a username and password to access the Internet.
Password	A password to access the Internet.
Password confirmation	The confirmation of the entered password (to avoid mistypes).
VPN server address	The IP or URL address of the PPTP or L2TP authentication server.

Parameter	Description
Encryption	Select a method of MPPE encryption. • **No encrypt**: MPPE encryption is not applied. • **MPPE 40/128 bit**: MPPE encryption with a 40-bit or 128-bit key is applied. • **MPPE 40 bit**: MPPE encryption with a 40-bit key is applied. • **MPPE 128 bit**: MPPE encryption with a 128-bit key is applied. MPPE encryption can be applied only if the **MS-CHAP, MS-CHAP-V2**, or **AUTO** value is selected from the **Authentication algorithm** drop-down list.
Authentication algorithm	Select a required authentication method from the drop-down list or leave the **AUTO** value.
MTU	The maximum size of units transmitted by the interface.
Keep Alive	Select the checkbox if you want the router to keep you connected to your ISP even when the connection has been inactive for a specified period of time. When the checkbox is selected, the **LCP interval** and **LCP fails** fields are available. Specify the required values.
Extra options	Advanced options of the pppd daemon which need to be specified for this connection. *Optional*.
Dial on demand	Select the checkbox if you want the router to establish connection to the Internet on demand. In the **Maximum idle time** field, specify a period of inactivity (in seconds) after which the connection should be terminated.
Static IP Address	Fill in the field if you want to use a static IP address to access the Internet.
PPP debug	Select the checkbox if you want to log all data on PPP connection debugging.
IP received	The IP address assigned by the ISP.

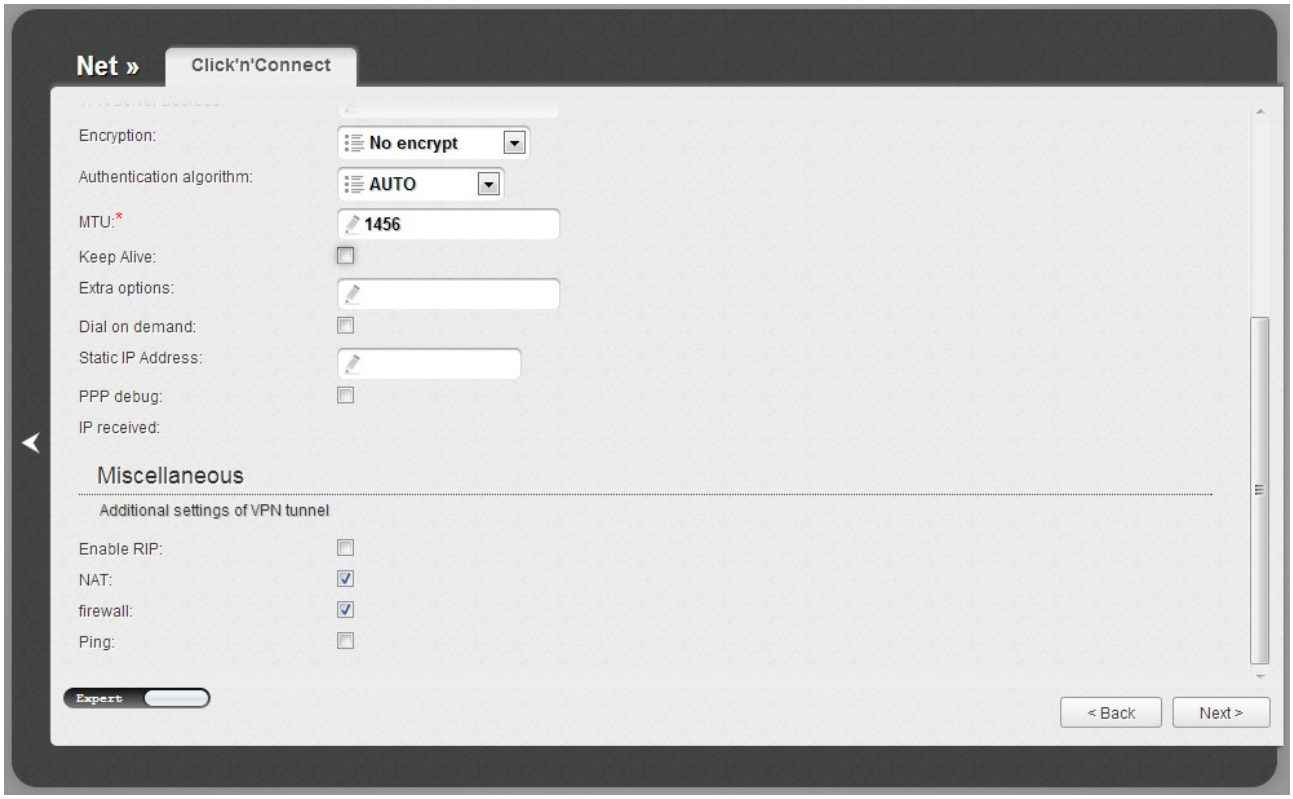

*Figure 43. Configuring PPTP + Static IP WAN connection. The expert settings mode. The **Miscellaneous** section.*

Parameter	Description
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

Click the **Next** button to continue.

After that the page displaying all specified settings opens. Click the **Apply** button to create the connection or the **Back** button to specify other settings.

After clicking the **Apply** button, the page for checking the Internet availability opens (see the ***Checking Internet Availability*** section, page 66).

PPTP + Dynamic IP or L2TP + Dynamic IP Connection

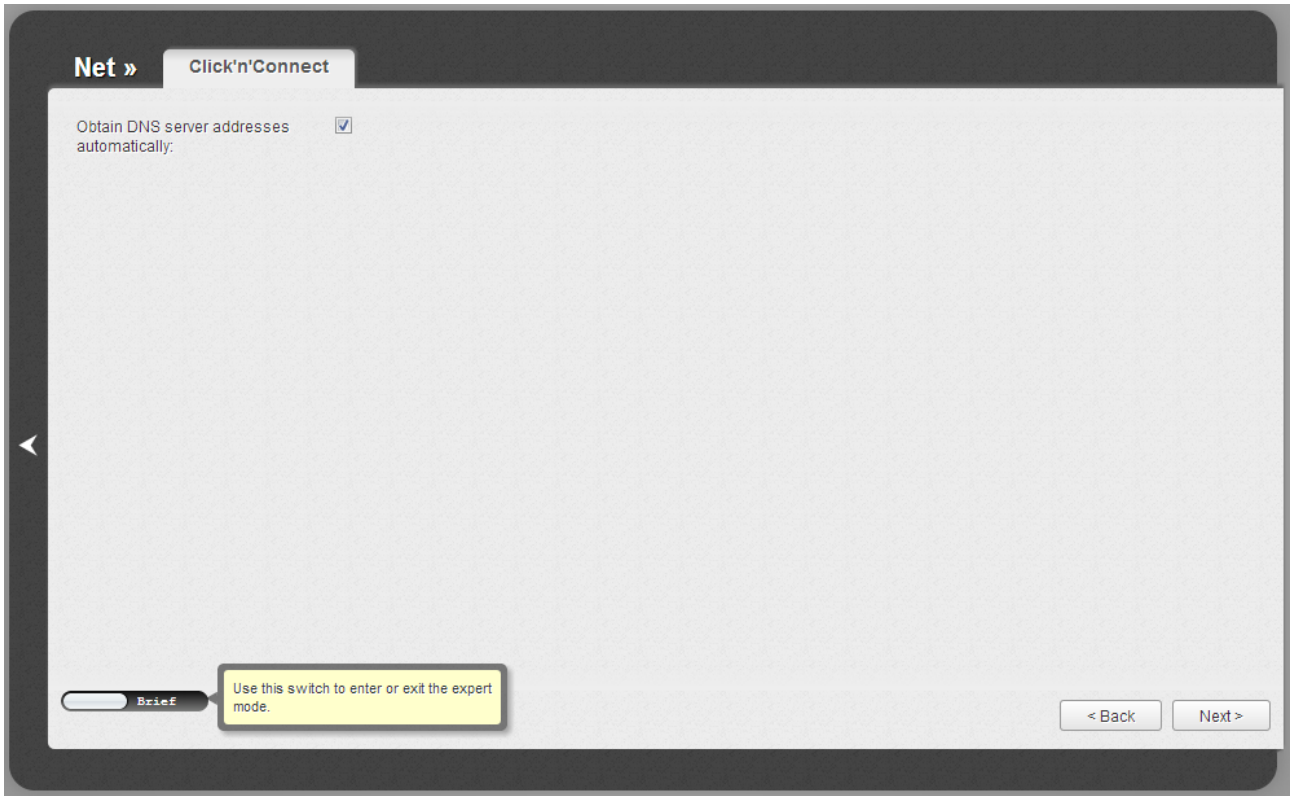

Figure 44. Configuring PPTP + Dynamic IP WAN connection.

If your ISP has provided the addresses of the DNS servers, deselect the **Obtain DNS server addresses automatically** checkbox and fill in the **Primary DNS server** field.

As a rule, the specified settings are enough to configure a non-protected connection of the selected type. If you need to specify additional settings, open the expert settings mode. To do this, use the switch in the bottom left corner of the page.

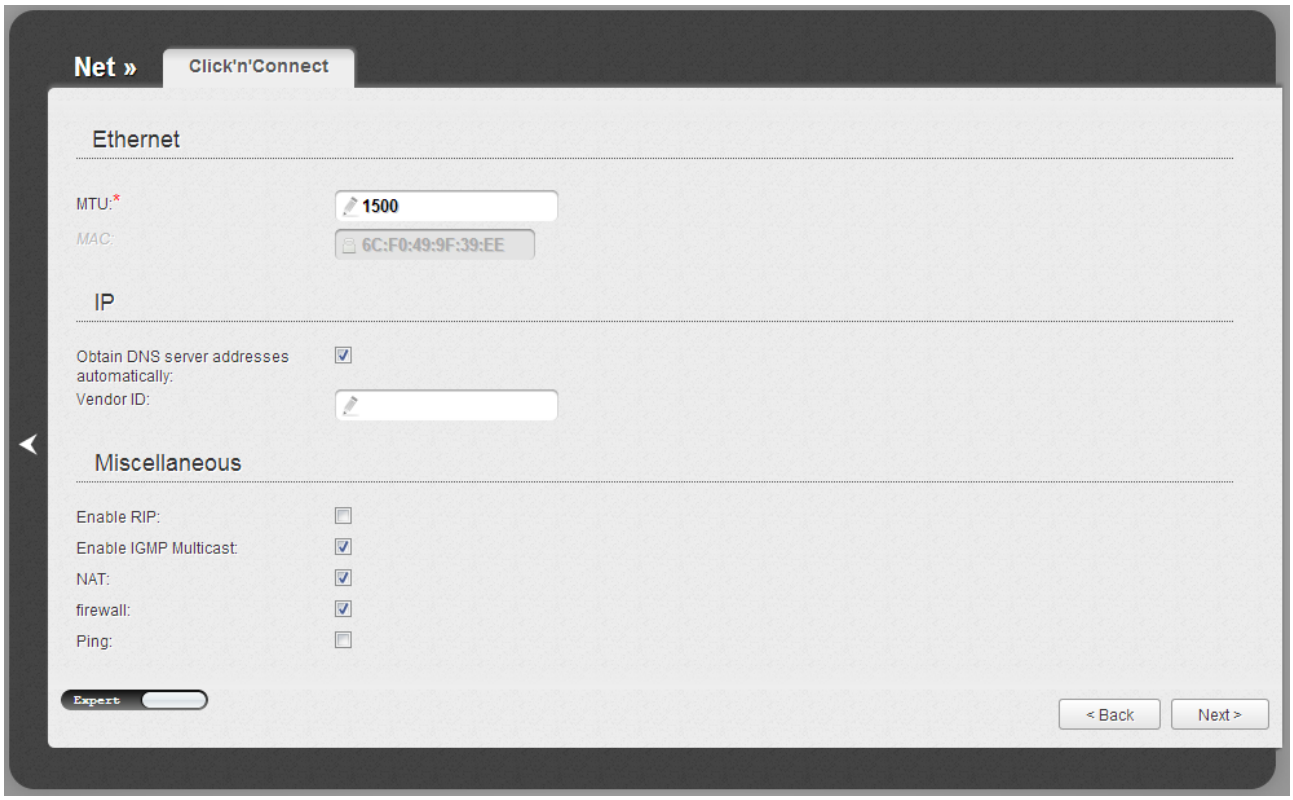

*Figure 45. Configuring PPTP + Dynamic IP WAN connection. The expert settings mode. The **Ethernet** section.*

Parameter	Description
Ethernet	
MTU	The maximum size of units transmitted by the interface.
MAC	A MAC address of the router's WAN interface. If you need to assign another MAC address to this connection, then after completing the Wizard proceed to the **Net / WAN** page, select the newly created connection, and change it as needed.

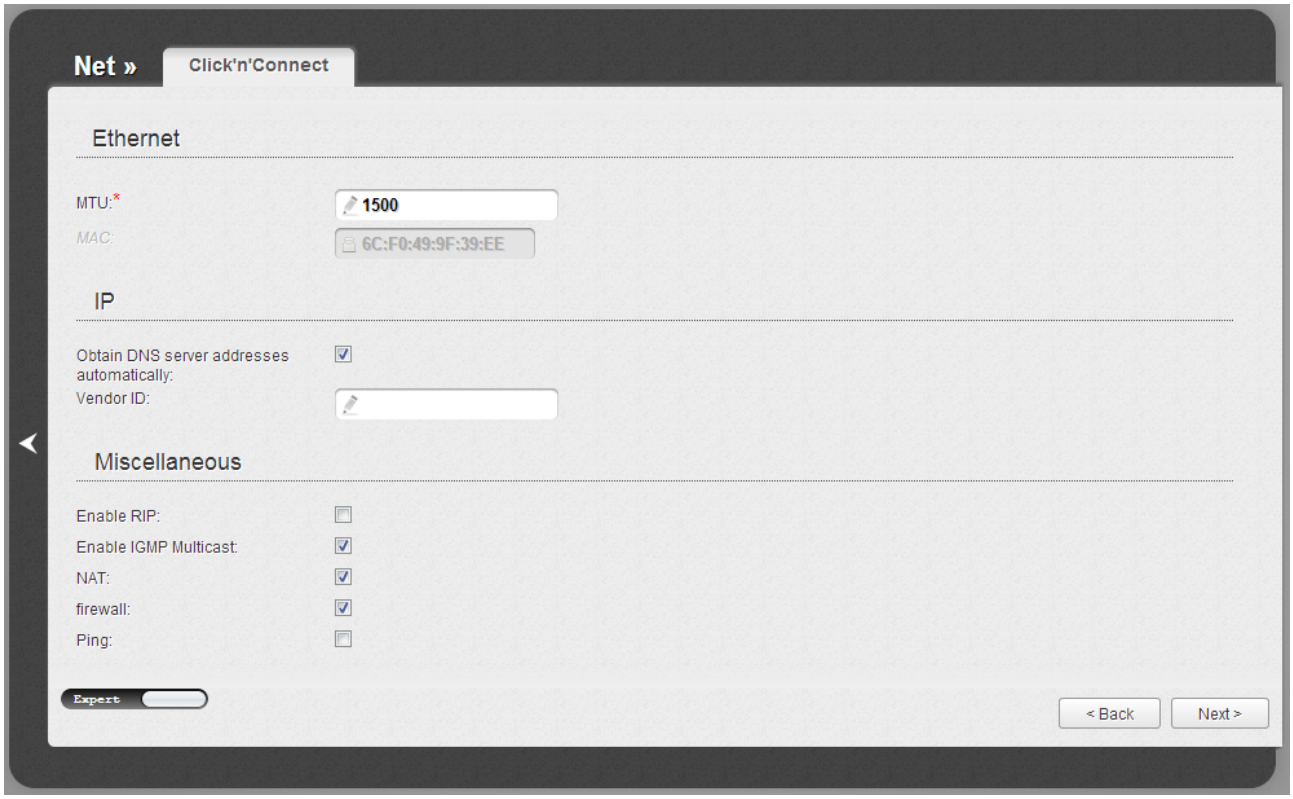

*Figure 46. Configuring PPTP + Dynamic IP WAN connection. The expert settings mode. The **IP** and **Miscellaneous** sections.*

Parameter	Description
IP	
Obtain DNS server addresses automatically	Select the checkbox to configure automatic assignment of DNS server addresses. If the checkbox is selected, the **Primary DNS server** and **Secondary DNS server** fields are not displayed.
Primary DNS server/ Secondary DNS server	Enter addresses of the primary and secondary DNS servers in the relevant fields.
Vendor ID	The identifier of your ISP. *Optional*.
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
Enable IGMP Multicast	Select the checkbox to allow multicast traffic from the external network (e.g. video streaming) to be received.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.

Parameter	Description
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

Click the **Next** button to continue.

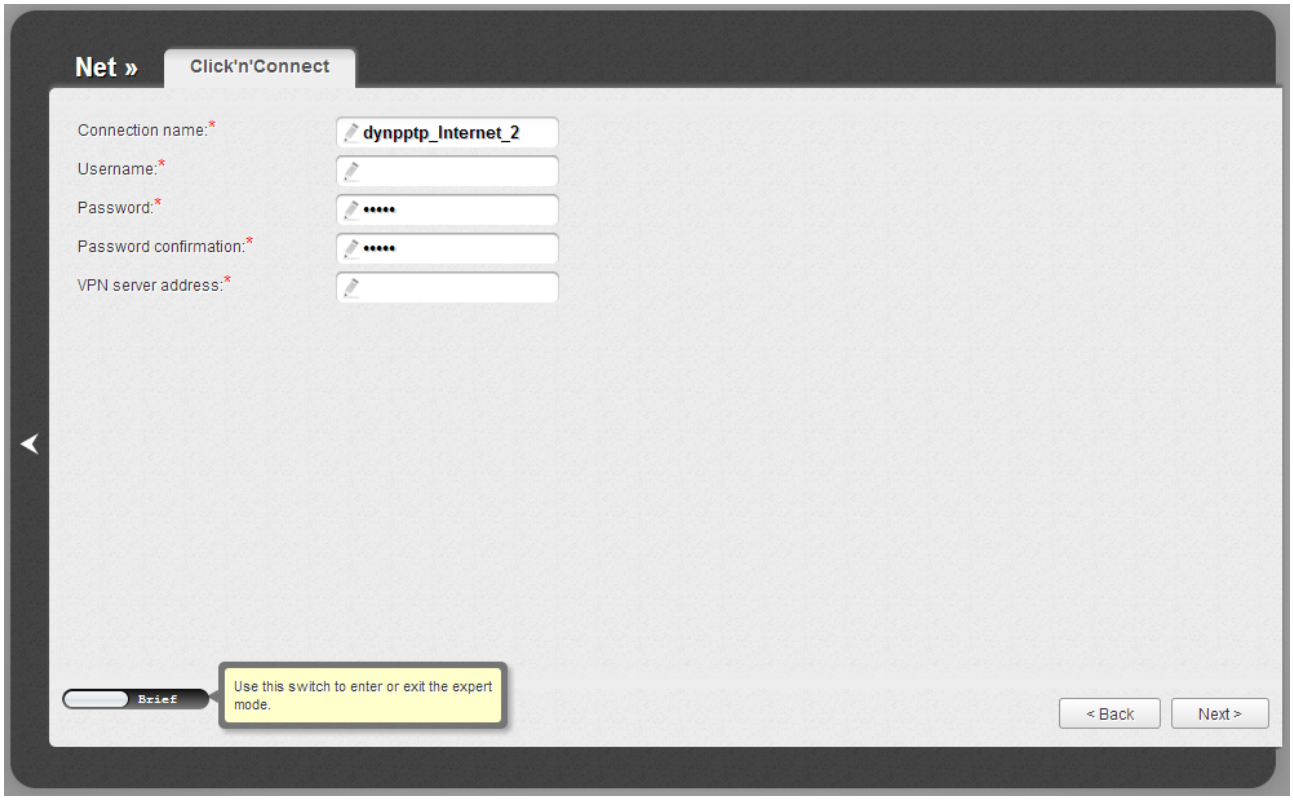

Figure 47. Configuring PPTP + Dynamic IP WAN connection.

In the **Connection name** field, specify a name for the connection for easier identification.

In the **Username** field, enter your login, and in the **Password** and **Password confirmation** fields – the password provided by your ISP.

In the **VPN server address** field, enter the IP or URL address of the PPTP or L2TP authentication server.

As a rule, the specified settings are enough to configure a protected connection (the VPN tunnel). If you need to specify additional settings, open the expert settings mode. To do this, use the switch in the bottom left corner of the page.

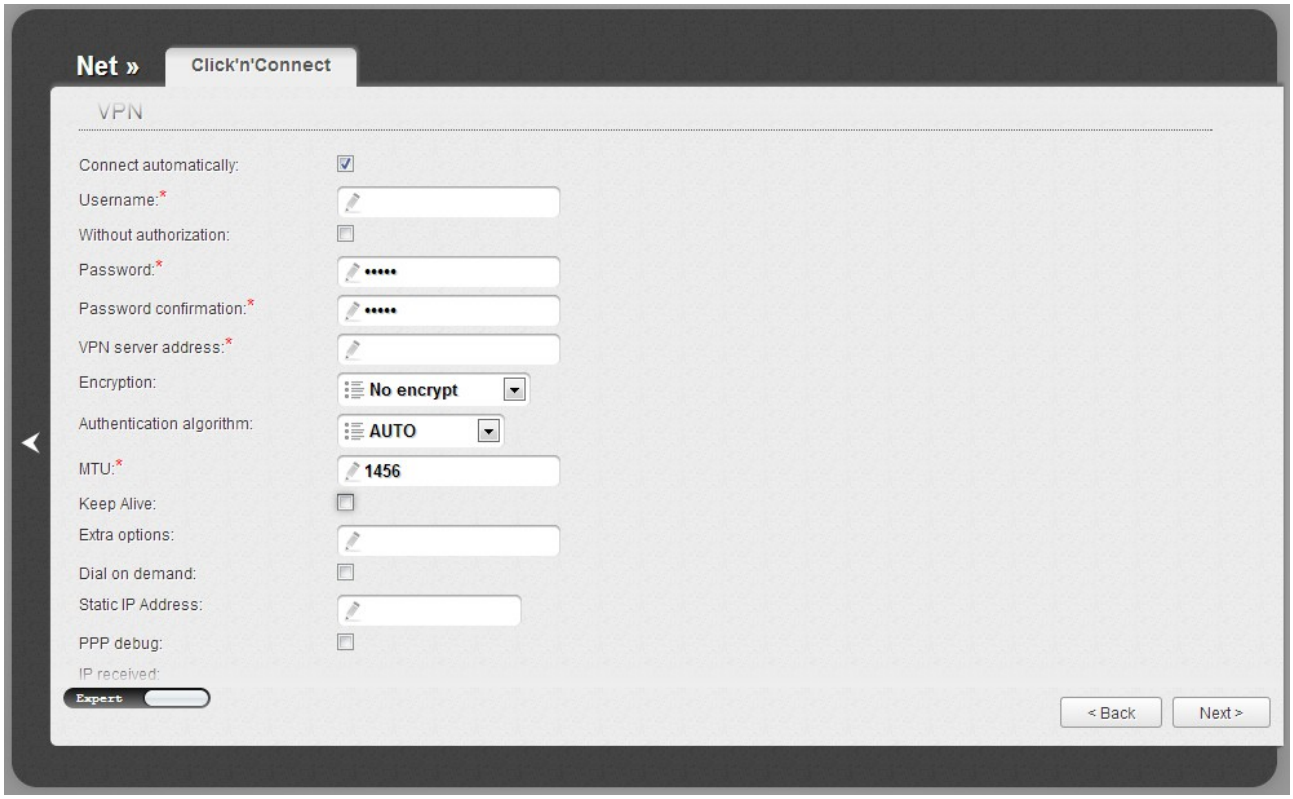

*Figure 48. Configuring PPTP + Dynamic IP WAN connection. The expert settings mode. The **VPN** section.*

Parameter	Description
Connection name	A name for connection for easier identification.
VPN	
Connect automatically	Select the checkbox to enable auto-start of the connection upon the boot-up of the router.
Username	A username (login) to access the Internet.
Without authorization	Select the checkbox if you don't need to enter a username and password to access the Internet.
Password	A password to access the Internet.
Password confirmation	The confirmation of the entered password (to avoid mistypes).
VPN server address	The IP or URL address of the PPTP or L2TP authentication server.

Parameter	Description
Encryption	Select a method of MPPE encryption. • **No encrypt**: MPPE encryption is not applied. • **MPPE 40/128 bit**: MPPE encryption with a 40-bit or 128-bit key is applied. • **MPPE 40 bit**: MPPE encryption with a 40-bit key is applied. • **MPPE 128 bit**: MPPE encryption with a 128-bit key is applied. MPPE encryption can be applied only if the **MS-CHAP, MS-CHAP-V2**, or **AUTO** value is selected from the **Authentication algorithm** drop-down list.
Authentication algorithm	Select a required authentication method from the drop-down list or leave the **AUTO** value.
MTU	The maximum size of units transmitted by the interface.
Keep Alive	Select the checkbox if you want the router to keep you connected to your ISP even when the connection has been inactive for a specified period of time. When the checkbox is selected, the **LCP interval** and **LCP fails** fields are available. Specify the required values.
Extra options	Advanced options of the pppd daemon which need to be specified for this connection. *Optional*.
Dial on demand	Select the checkbox if you want the router to establish connection to the Internet on demand. In the **Maximum idle time** field, specify a period of inactivity (in seconds) after which the connection should be terminated.
Static IP Address	Fill in the field if you want to use a static IP address to access the Internet.
PPP debug	Select the checkbox if you want to log all data on PPP connection debugging.
IP received	The IP address assigned by the ISP.

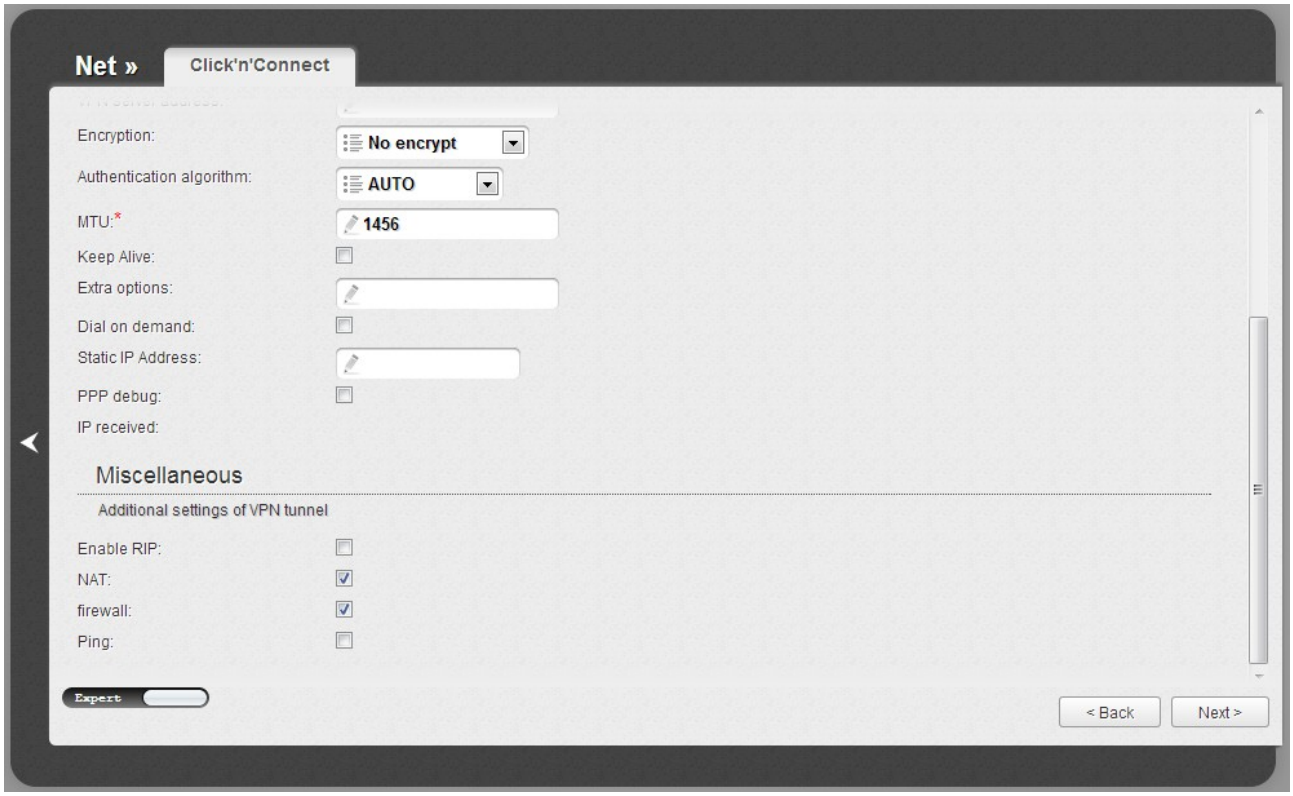

*Figure 49. Configuring PPTP + Dynamic IP WAN connection. The expert settings mode. The **Miscellaneous** section.*

Parameter	Description
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

Click the **Next** button to continue.

After that the page displaying all specified settings opens. Click the **Apply** button to create the connection or the **Back** button to specify other settings.

After clicking the **Apply** button, the page for checking the Internet availability opens (see the ***Checking Internet Availability*** section, page 66).

Checking Internet Availability

On the page, you can check the WAN connection you have created.

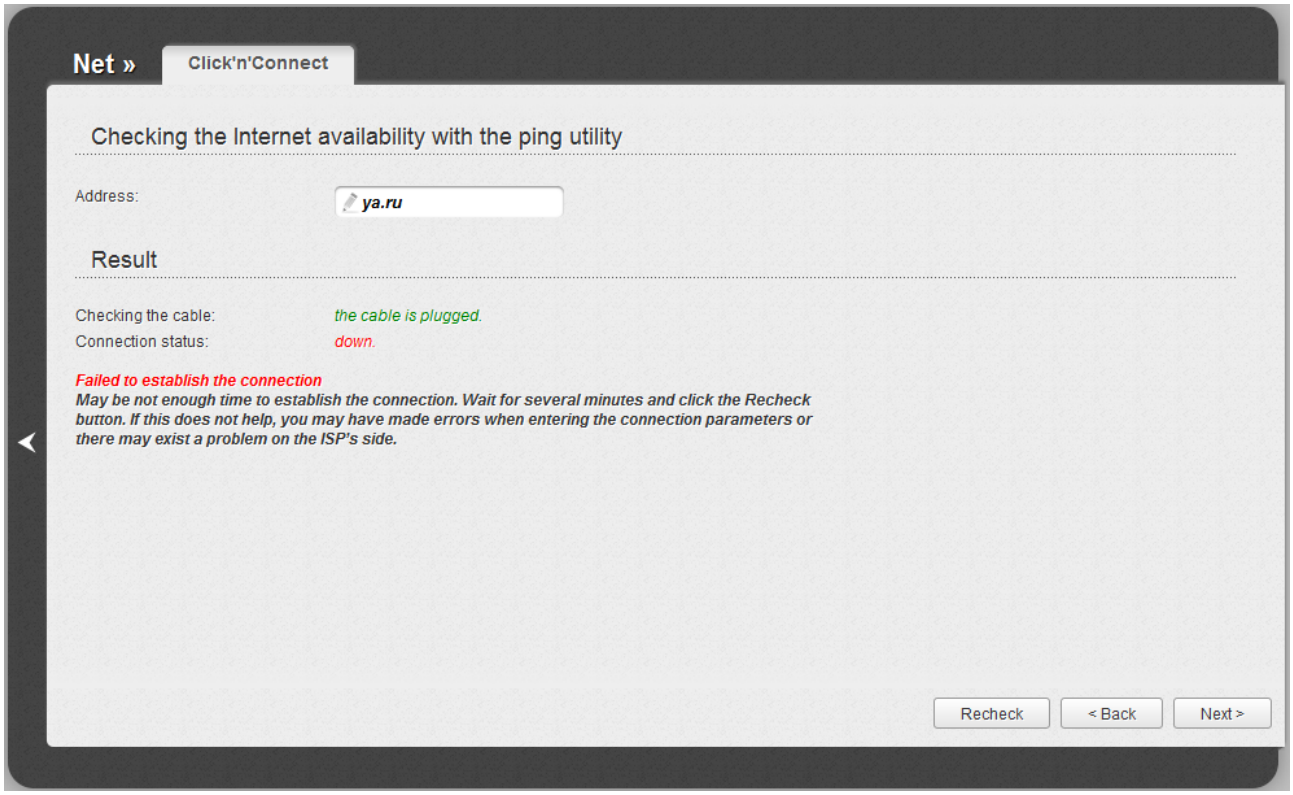
Net »
Click'n'Connect
Checking the Internet availability with the ping utility
Address:
ya.ru
Result
Checking the cable:
the cable is plugged.
Connection status:
down.
Failed to establish the connection
May be not enough time to establish the connection. Wait for several minutes and click the Recheck button. If this does not help, you may have made errors when entering the connection parameters or there may exist a problem on the ISP's side.
Recheck
< Back
Next >

Figure 50. Checking the Internet availability.

In the **Result** section, the status of the WAN connection and possible causes of malfunctions are displayed. To recheck the status of the WAN connection, enter the IP address or name of a host in the **Address** field or leave the value specified by default (`ya.ru`). Then click the **Recheck** button.

Click the **Back** button to specify other settings.

Click the **Next** button to continue.

After clicking the **Next** button, the page for configuring wireless connection opens (see the ***Configuring Wireless Connection*** section, page 67).

Configuring Wireless Connection

In this master section, you can configure the 2.4GHz band WLAN. In order to configure the 5GHz band WLAN, proceed to the **5 GHz** tab of the pages **Wi-Fi/Basic settings** and **Wi-Fi/Security settings**.

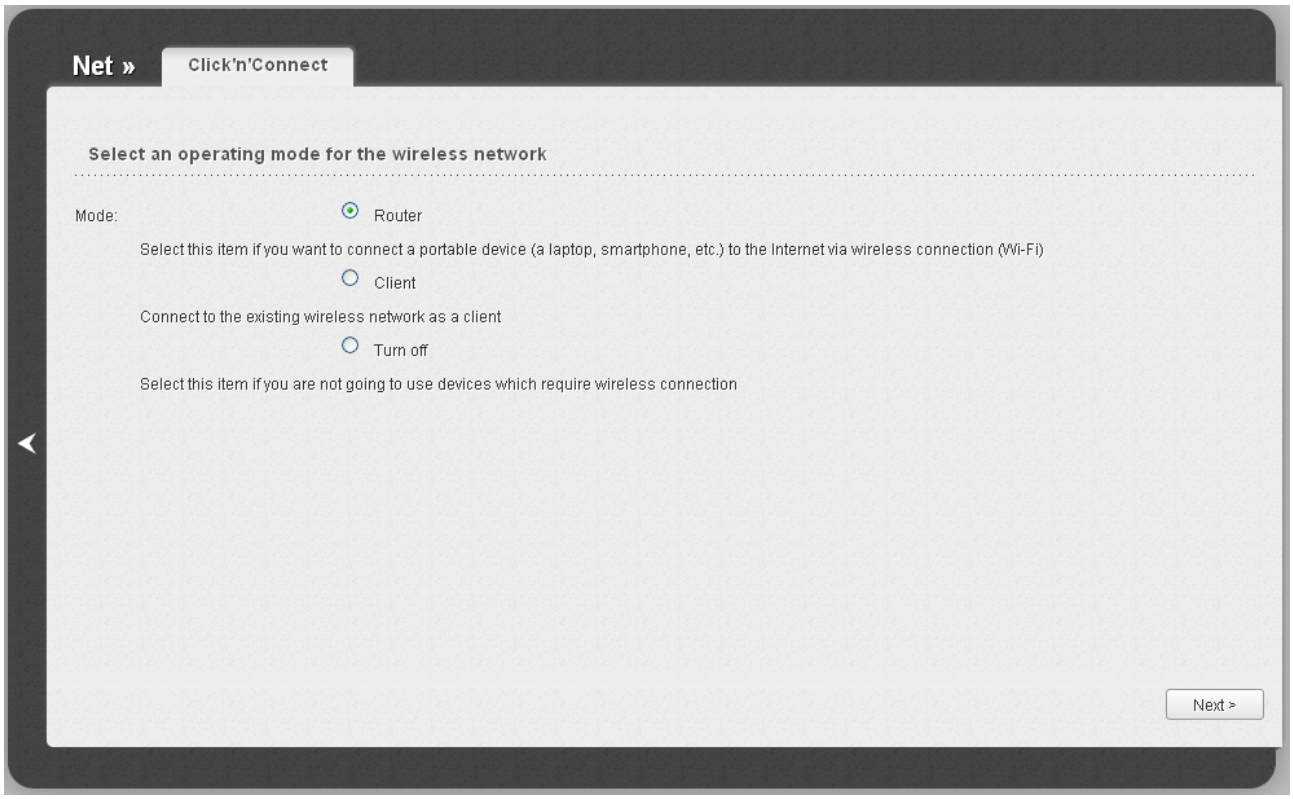
Net »
Click'n'Connect
Select an operating mode for the wireless network
Mode:
Router
Select this item if you want to connect a portable device (a laptop, smartphone, etc.) to the Internet via wireless connection (Wi-Fi)
Client
Connect to the existing wireless network as a client
Turn off
Select this item if you are not going to use devices which require wireless connection
Next >

Figure 51. Selecting the operating mode for the wireless network.

If you are not going to use the wireless connection, select the **Turn off** choice of the **Mode** radio button. Click the **Next** button and then click the **Save** button on the opened page. After clicking the button, the page for configuring the router to use an IPTV set-top box opens (see the ***Configuring IPTV*** section, page 72).

If you want to connect portable devices to the Internet via wireless connection, select the **Router** choice of the **Mode** radio button. Click the **Next** button.

If you want to configure the router as a client to connect to a wireless access point, select the **Client** choice of the **Mode** radio button. Click the **Next** button.

Router Mode

On the opened page, in the **SSID** field, specify a new name for the network (use digits and Latin characters).

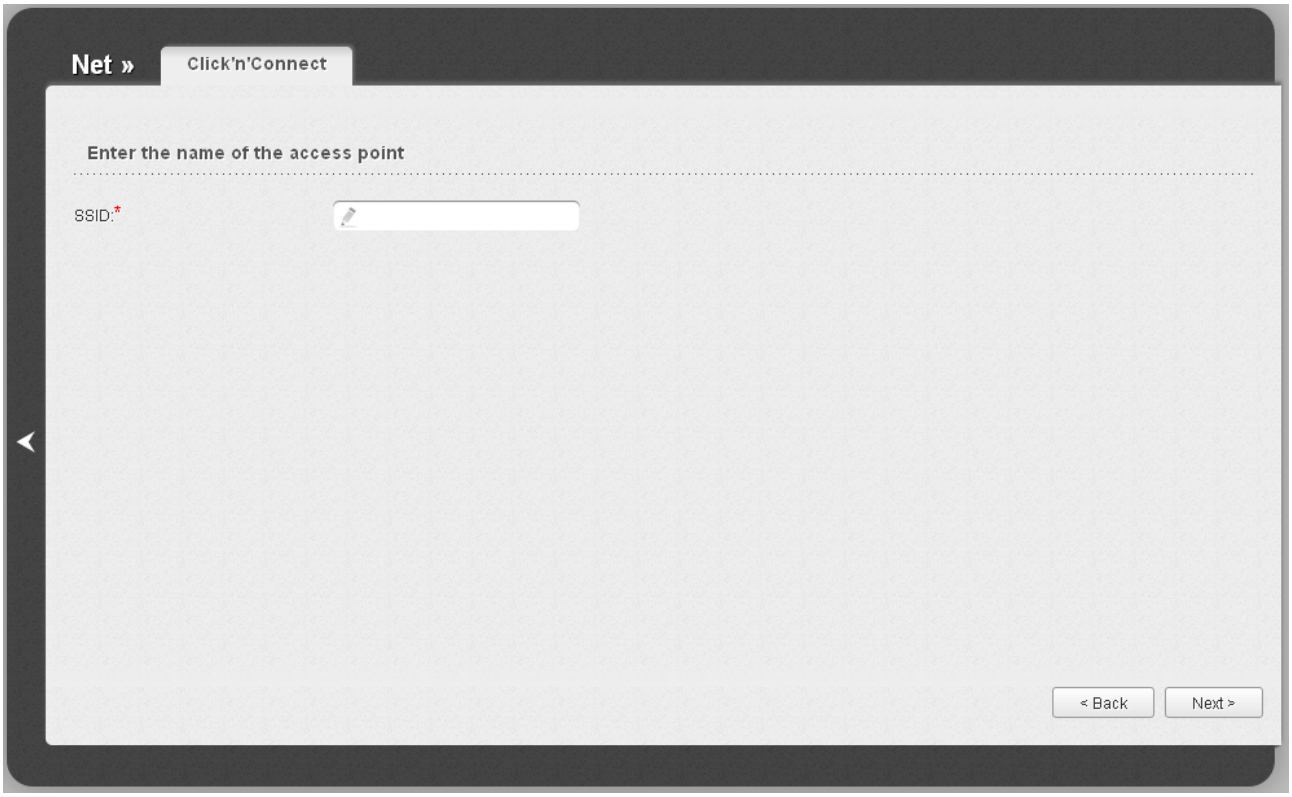

Figure 52. Changing the name of the wireless LAN.

Click the **Next** button to continue.

On the next page, you can modify security settings of the WLAN.

! The default security settings do not provide sufficient protection for the WLAN. Please, specify your own security settings for the WLAN.

Select the **Protected** value from the **Network Authentication** drop-down list and enter a key (a password that will be used to access your wireless network) in the **Network key** field. Use digits and Latin characters. After applying this setting, the **WPA-PSK/WPA2-PSK mixed** authentication type is specified for the router's WLAN.

When the **Open** value is selected, the **Network key** field is unavailable. After applying this setting, the **Open** authentication type with no encryption is specified for the router's WLAN.

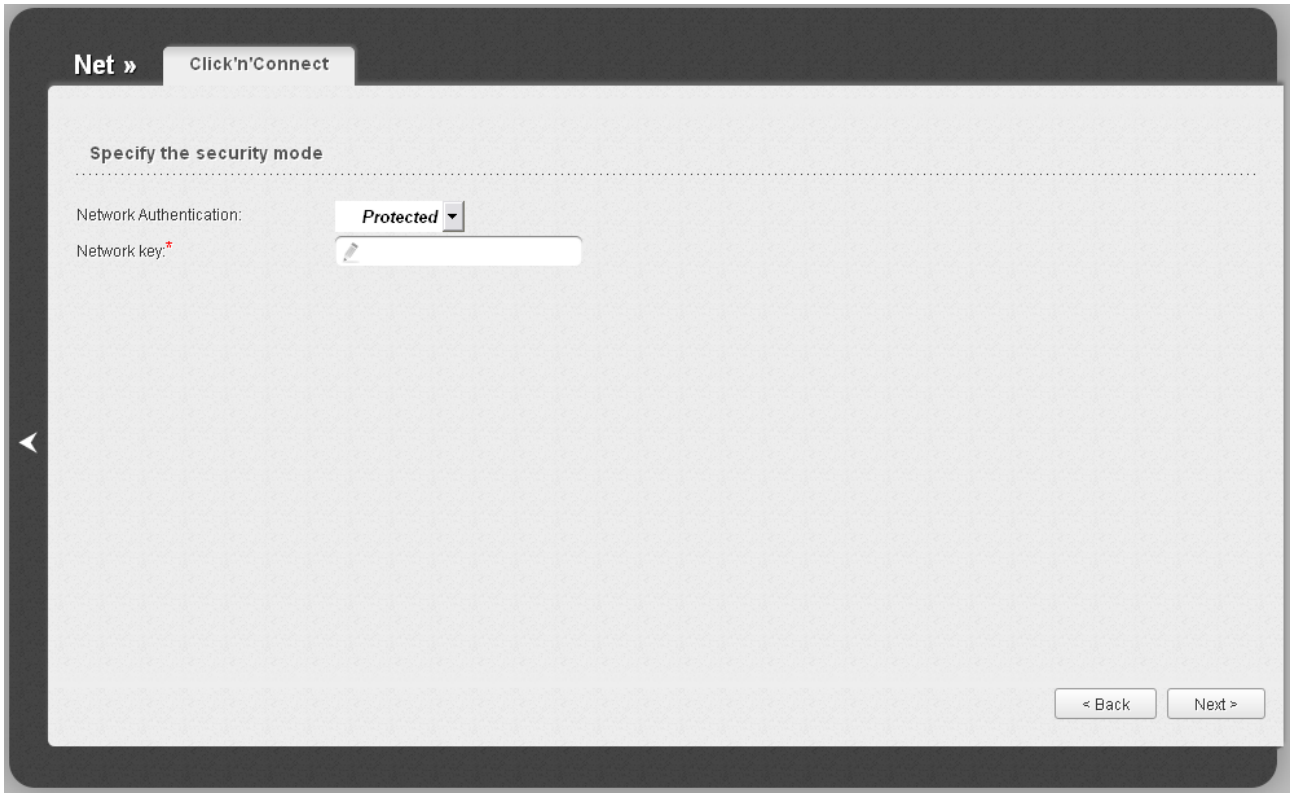

Figure 53. Selecting a security mode for the wireless network.

Click the **Next** button to continue.

On the next page, the specified settings are displayed. Make sure that they are correct and then click the **Save** button. After clicking the button, the page for configuring the router to use an IPTV set-top box opens (see the ***Configuring IPTV*** section, page 72).

Client Mode

On the opened page, click the **Search** button.

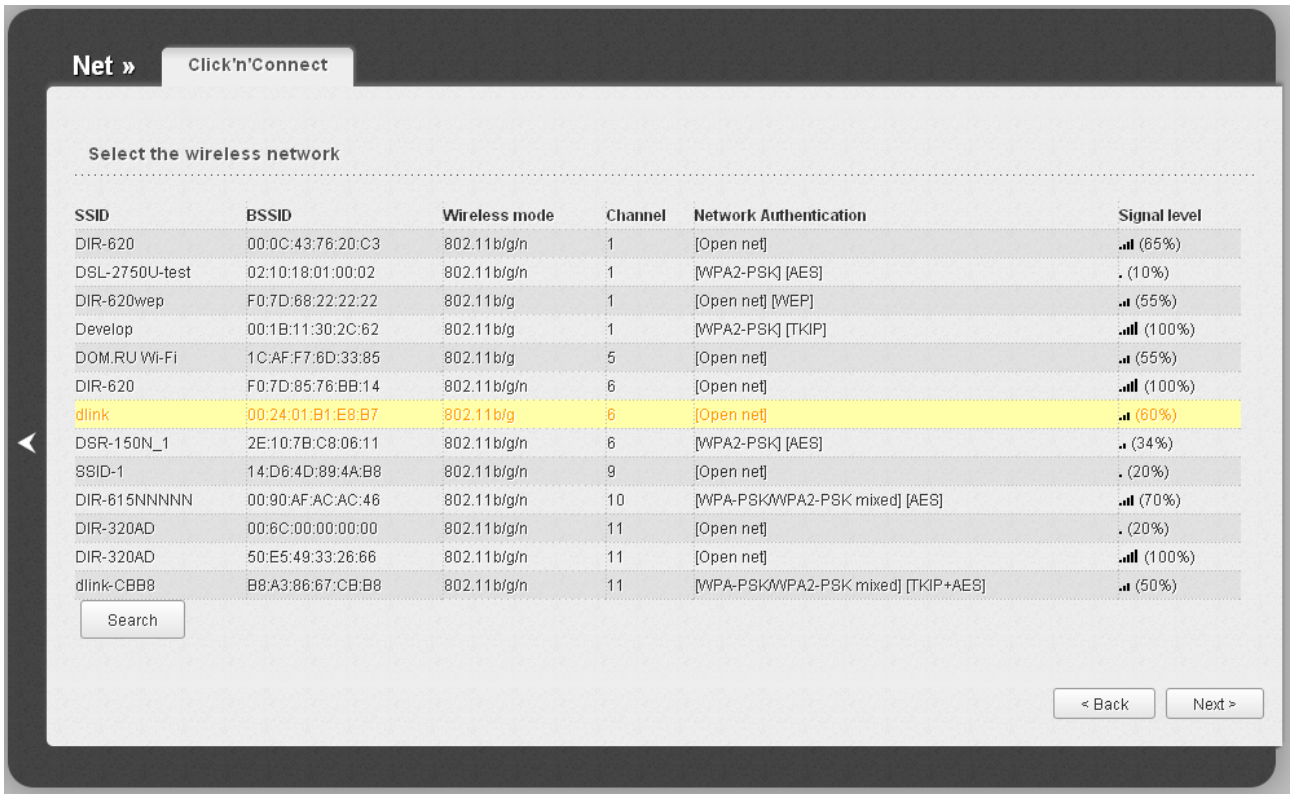
Net »
Click'n'Connect
Select the wireless network
SSID BSSID Wireless mode Channel Network Authentication Signal level
DIR-620 00:0C:43:76:20:C3 802.11b/g/n 1 [Open net] (65%)
DSL-2750U-test 02:10:18:01:00:02 802.11b/g/n 1 [WPA2-PSK] [AES] (10%)
DIR-620wep F0:7D:68:22:22:22 802.11b/g 1 [Open net] [WEP] (55%)
Develop 00:1B:11:30:2C:62 802.11b/g 1 [WPA2-PSK] [TKIP] (100%)
DOM.RU Wi-Fi 1C:AF:F7:6D:33:85 802.11b/g 5 [Open net] (55%)
DIR-620 F0:7D:85:76:BB:14 802.11b/g/n 6 [Open net] (100%)
dlink 00:24:01:B1:E8:B7 802.11b/g 6 [Open net] (60%)
DSR-150N_1 2E:10:7B:C8:06:11 802.11b/g/n 6 [WPA2-PSK] [AES] (34%)
SSID-1 14:D6:4D:89:4A:B8 802.11b/g/n 9 [Open net] (20%)
DIR-615NNNNN 00:90:AF:AC:AC:46 802.11b/g/n 10 [WPA-PSK/WPA2-PSK mixed] [AES] (70%)
DIR-320AD 00:6C:00:00:00:00 802.11b/g/n 11 [Open net] (20%)
DIR-320AD 50:E5:49:33:26:66 802.11b/g/n 11 [Open net] (100%)
dlink-CBB8 B8:A3:86:67:CB:B8 802.11b/g/n 11 [WPA-PSK/WPA2-PSK mixed] [TKIP+AES] (50%)
Search
< Back
Next >

Figure 54. Selecting a network to connect.

Select the network to which you want to connect and click the **Next** button.

On the next page, you need to enter the password for connection to the network.

Figure 55. Entering the password for connection to the wireless network.

Enter the password in the **Network key** field. If you don't need a password to connect to the selected network, the **Network key** field is unavailable.

Click the **Next** button.

On the next page, the parameters of the network to which you want to connect and the entered password are displayed. Make sure that the specified settings are correct and then click the **Save** button. After that, the wireless channel of DIR-815 will switch to the channel of the wireless access point to which you have connected.

After configuring the device as a client, you need to create a WAN connection with relevant parameters for the **WiFiClient** port.

After clicking the **Save** button, the page for configuring the router to use an IPTV set-top box opens (see the ***Configuring IPTV*** section, page 72).

Configuring IPTV

On the page, you can configure the router to use an IPTV set-top box.

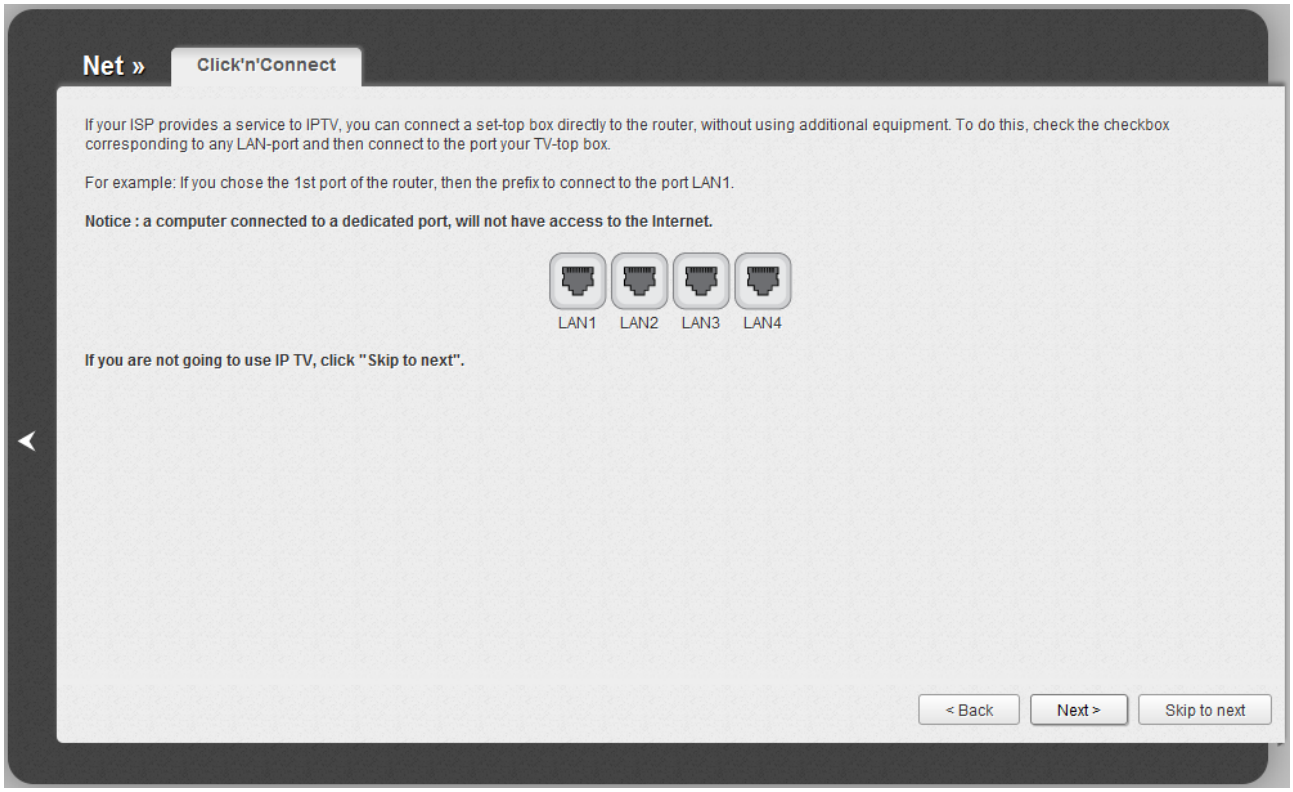
Net »
Click'n'Connect
If your ISP provides a service to IPTV, you can connect a set-top box directly to the router, without using additional equipment. To do this, check the checkbox corresponding to any LAN-port and then connect to the port your TV-top box.
For example: If you chose the 1st port of the router, then the prefix to connect to the port LAN1.
Notice : a computer connected to a dedicated port, will not have access to the Internet.
LAN1
LAN2
LAN3
LAN4
If you are not going to use IP TV, click "Skip to next".
< Back
Next >
Skip to next

Figure 56. Selecting a LAN port to connect an IPTV set-top box.

On the opened page, select the LAN port of the router to which you will connect your IPTV set-top box.

If in the future you need to disconnect your IPTV set-top box from the specified LAN port and connect to it a computer, start the **IPTV settings wizard** (for the detailed description of the Wizard, see the ***IPTV Settings Wizard*** section, page 80).

If for accessing the Internet and IPTV services your ISP uses virtual local area networks with identifiers (VLAN ID), to configure access to the IPTV service, proceed to the **Advanced / VLAN** page, create a group of ports with the required value of the **VLAN ID** parameter, **Transparent** type, and the port to which the set-top box will be connected (see the ***VLAN*** section, page 133, for a detailed description of the elements from the page).

Click the **Back** button to specify other settings for your wireless network.

Click the **Next** button to continue.

Click the **Skip to next** button in order not to apply the IPTV settings.

On the opened page, click the **Back** button to specify other settings for configuring the router to use an IPTV set-top box.

Click the **Save** button to save the specified settings.

After clicking the **Save** button, the quick settings page opens.

Wireless Network Settings Wizard

To specify all needed settings for your 2.4GHz WLAN, click the **Wireless network settings wizard** in the **Wi-Fi** section. In order to configure the 5GHz band WLAN, proceed to the **5 GHz** tab of the pages **Wi-Fi/Basic settings** and **Wi-Fi/Security settings**.

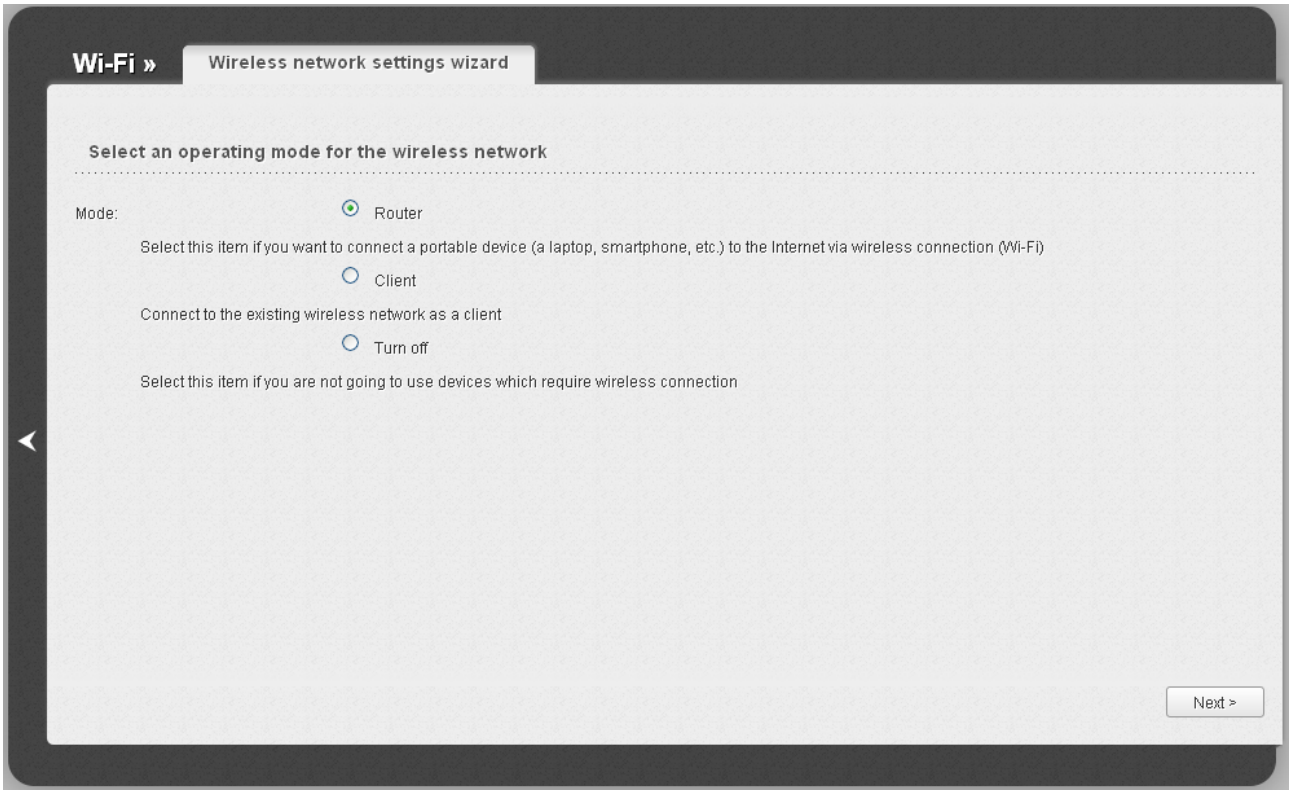
Wi-Fi »
Wireless network settings wizard
Select an operating mode for the wireless network
Mode:
Router
Select this item if you want to connect a portable device (a laptop, smartphone, etc.) to the Internet via wireless connection (Wi-Fi)
Client
Connect to the existing wireless network as a client
Turn off
Select this item if you are not going to use devices which require wireless connection
Next >

Figure 57. The page for selecting the operating mode for the wireless network.

If you are not going to use the wireless connection, select the **Turn off** choice of the **Mode** radio button. Click the **Next** button and then click the **Save** button on the opened page. After clicking the button, the quick settings page opens.

If you want to connect portable devices to the Internet via wireless connection, select the **Router** choice of the **Mode** radio button. Click the **Next** button.

If you want to configure the router as a client to connect to a wireless access point, select the **Client** choice of the **Mode** radio button. Click the **Next** button.

Router Mode

On the opened page, in the **SSID** field, specify a new name for the network (use digits and Latin characters).

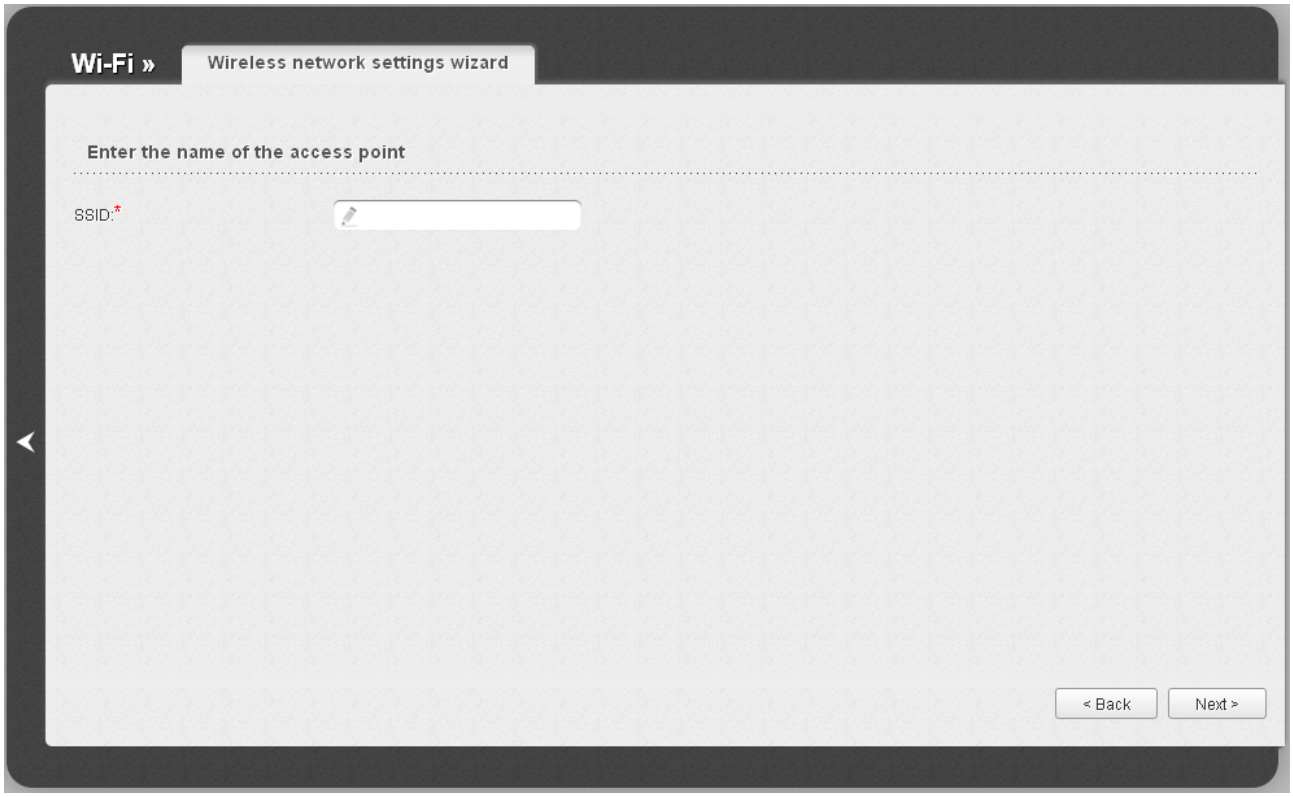

Figure 58. Page for changing the name of the wireless LAN.

Click the **Next** button to continue.

On the next page, you can modify security settings of the WLAN.

! The default security settings do not provide sufficient protection for the WLAN. Please, specify your own security settings for the WLAN.

Select the **Protected** value from the **Network Authentication** drop-down list and enter a key (a password that will be used to access your wireless network) in the **Network key** field. Use digits and Latin characters. After applying this setting, the **WPA-PSK/WPA2-PSK mixed** authentication type is specified for the router's WLAN.

When the **Open** value is selected, the **Network key** field is unavailable. After applying this setting, the **Open** authentication type with no encryption is specified for the router's WLAN.

Figure 59. Page for selecting a security mode for the wireless network.

Click the **Next** button to continue.

On the next page, the specified settings are displayed. Make sure that they are correct and then click the **Save** button. After clicking the button, the quick settings page opens.

Client Mode

On the opened page, click the **Search** button.

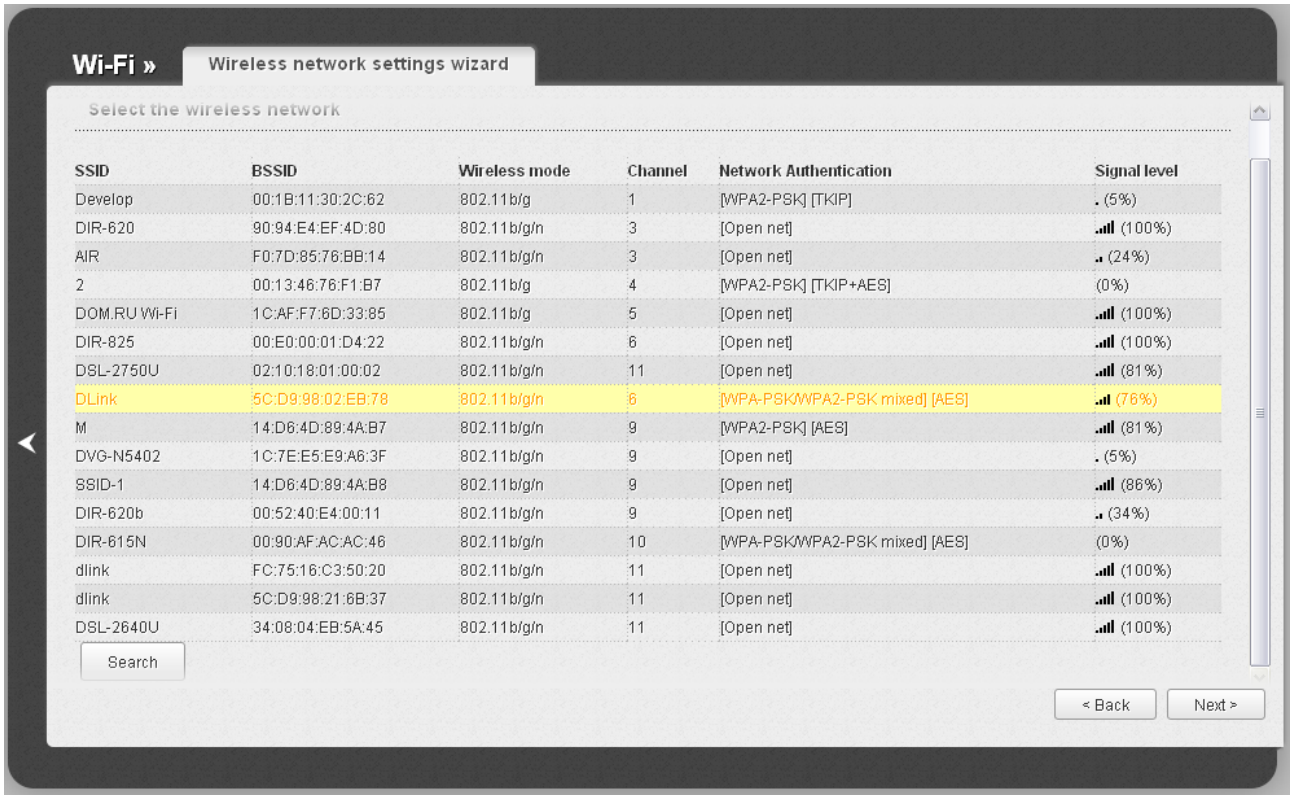
Wi-Fi »
Wireless network settings wizard
Select the wireless network
SSID BSSID Wireless mode Channel Network Authentication Signal level
Develop 00:1B:11:30:2C:62 802.11b/g 1 [WPA2-PSK] [TKIP] (5%)
DIR-620 90:94:E4:EF:4D:80 802.11b/g/n 3 [Open net] (100%)
AIR F0:7D:85:76:BB:14 802.11b/g/n 3 [Open net] (24%)
2 00:13:46:76:F1:B7 802.11b/g 4 [WPA2-PSK] [TKIP+AES] (0%)
DOM.RU Wi-Fi 1C:AF:F7:6D:33:85 802.11b/g 5 [Open net] (100%)
DIR-825 00:E0:00:01:D4:22 802.11b/g/n 6 [Open net] (100%)
DSL-2750U 02:10:18:01:00:02 802.11b/g/n 11 [Open net] (81%)
DLink 5C:D9:98:02:EB:78 802.11b/g/n 6 [WPA-PSK/WPA2-PSK mixed] [AES] (76%)
M 14:D6:4D:89:4A:B7 802.11b/g/n 9 [WPA2-PSK] [AES] (81%)
DVG-N5402 1C:7E:E5:E9:A6:3F 802.11b/g/n 9 [Open net] (5%)
SSID-1 14:D6:4D:89:4A:B8 802.11b/g/n 9 [Open net] (86%)
DIR-620b 00:52:40:E4:00:11 802.11b/g/n 9 [Open net] (34%)
DIR-615N 00:90:AF:AC:AC:46 802.11b/g/n 10 [WPA-PSK/WPA2-PSK mixed] [AES] (0%)
dlink FC:75:16:C3:50:20 802.11b/g/n 11 [Open net] (100%)
dlink 5C:D9:98:21:6B:37 802.11b/g/n 11 [Open net] (100%)
DSL-2640U 34:08:04:EB:5A:45 802.11b/g/n 11 [Open net] (100%)
Search
< Back
Next >

Figure 60. The page for selecting a network to connect.

Select the network to which you want to connect and click the **Next** button.

On the next page, you need to enter the password for connection to the network.

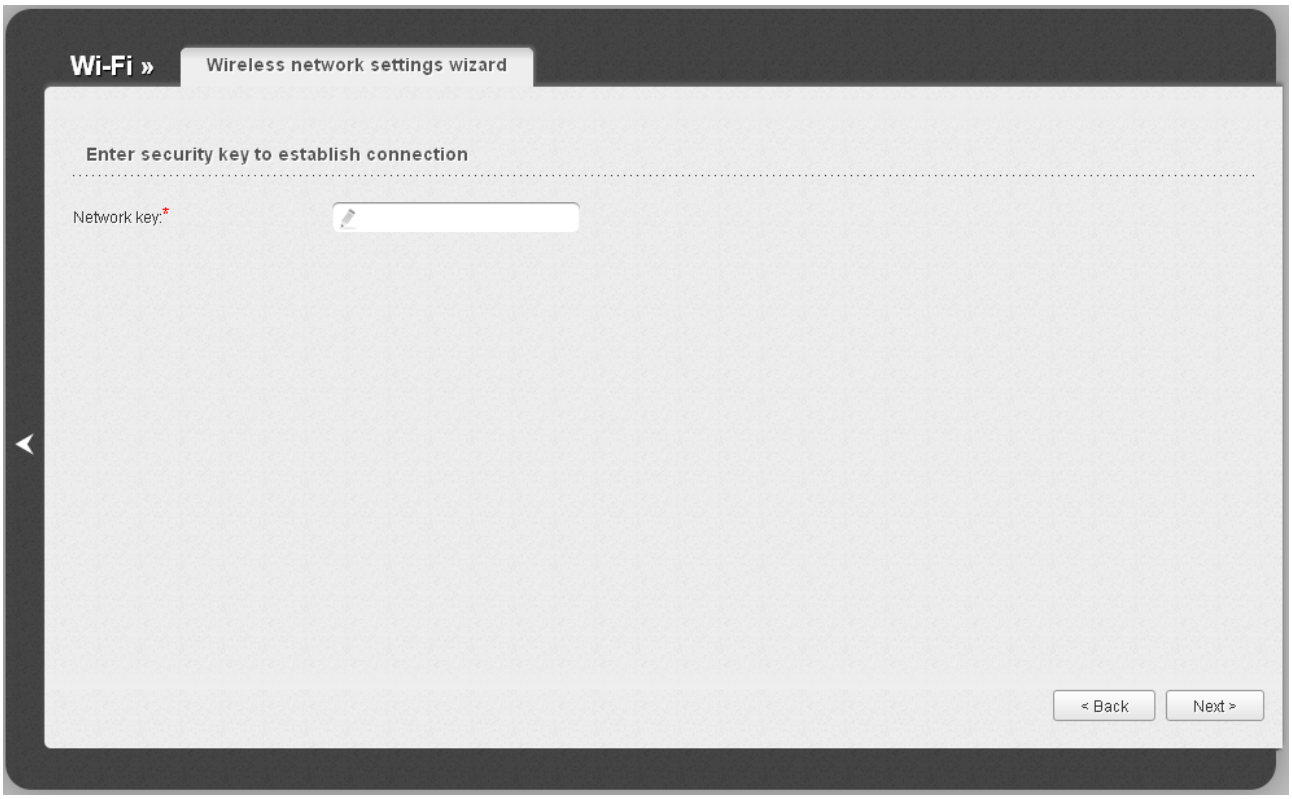

Figure 61. The page for entering the password for connection to the wireless network.

Enter the password in the **Network key** field. If you don't need a password to connect to the selected network, the **Network key** field is unavailable.

Click the **Next** button.

On the next page, the parameters of the network to which you want to connect and the entered password are displayed. Make sure that the specified settings are correct and then click the **Save** button. After that, the wireless channel of DIR-815 will switch to the channel of the wireless access point to which you have connected.

After configuring the device as a client, you need to create a WAN connection with relevant parameters for the **WiFiClient** port.

After clicking the **Save** button, the quick settings page opens.

Virtual Server Settings Wizard

To create a virtual server for redirecting incoming Internet traffic to a specified IP address in the LAN, click the **Virtual server settings wizard** link in the **Firewall** section.

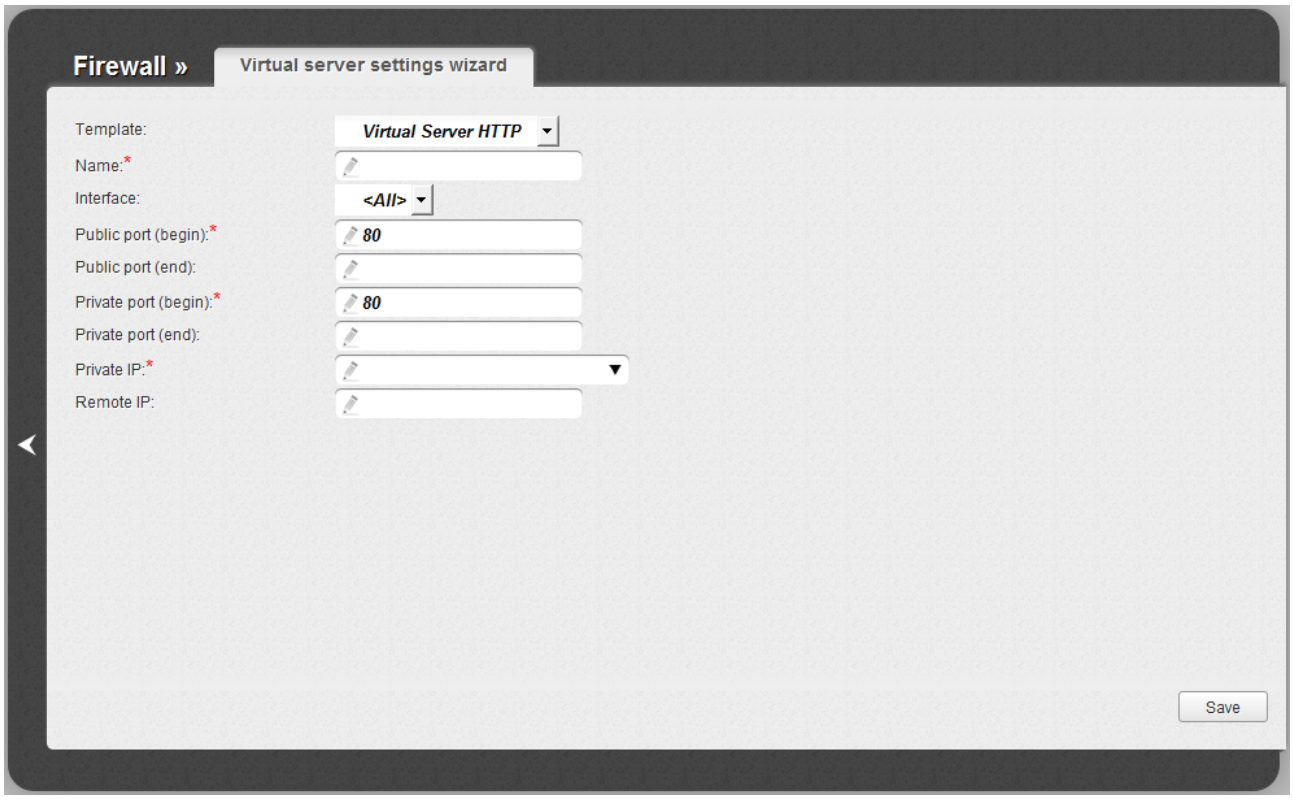

Figure 62. The page for adding a virtual server.

On the opened page, you can specify the following parameters:

Parameter	Description
Template	Select a virtual server template from the drop-down list, or select **Custom** to specify all parameters of the new virtual server manually.
Name	Enter a name for the virtual server for easier identification. You can specify any name.
Interface	Select a WAN connection to which this virtual server will be assigned.
Public port (begin)/ Public port (end)	A port of the router from which traffic is directed to the IP address specified in the **Private IP** field. Specify the start and the end value for the port range. If you need to specify one port, enter the needed value in the **Public port (begin)** field and leave the **Public port (end)** field blank.

Parameter	Description
Private port (begin)/ Private port (end)	A port of the IP address specified in the **Private IP** field to which traffic is directed from the **Public port**. Specify the start and the end value for the port range. If you need to specify one port, enter the needed value in the **Private port (begin)** field and leave the **Private port (end)** field blank.
Private IP	Enter the IP address of the server from the local area network. To choose a device connected to the router's LAN at the moment, select the relevant value from the drop-down list (the field will be filled in automatically).
Remote IP	Enter the IP address of the server from the external network.

When needed settings are configured, click the **Save** button. After successful creation of the virtual server a notification appears. Click the **OK** button in the notification window, and then click the **Back** icon ( ) on the left side of the page to get back to the quick settings page.

IPTV Settings Wizard

To configure the router to use an IPTV set-top box, click the **IPTV settings wizard** link in the **IP-TV** section.

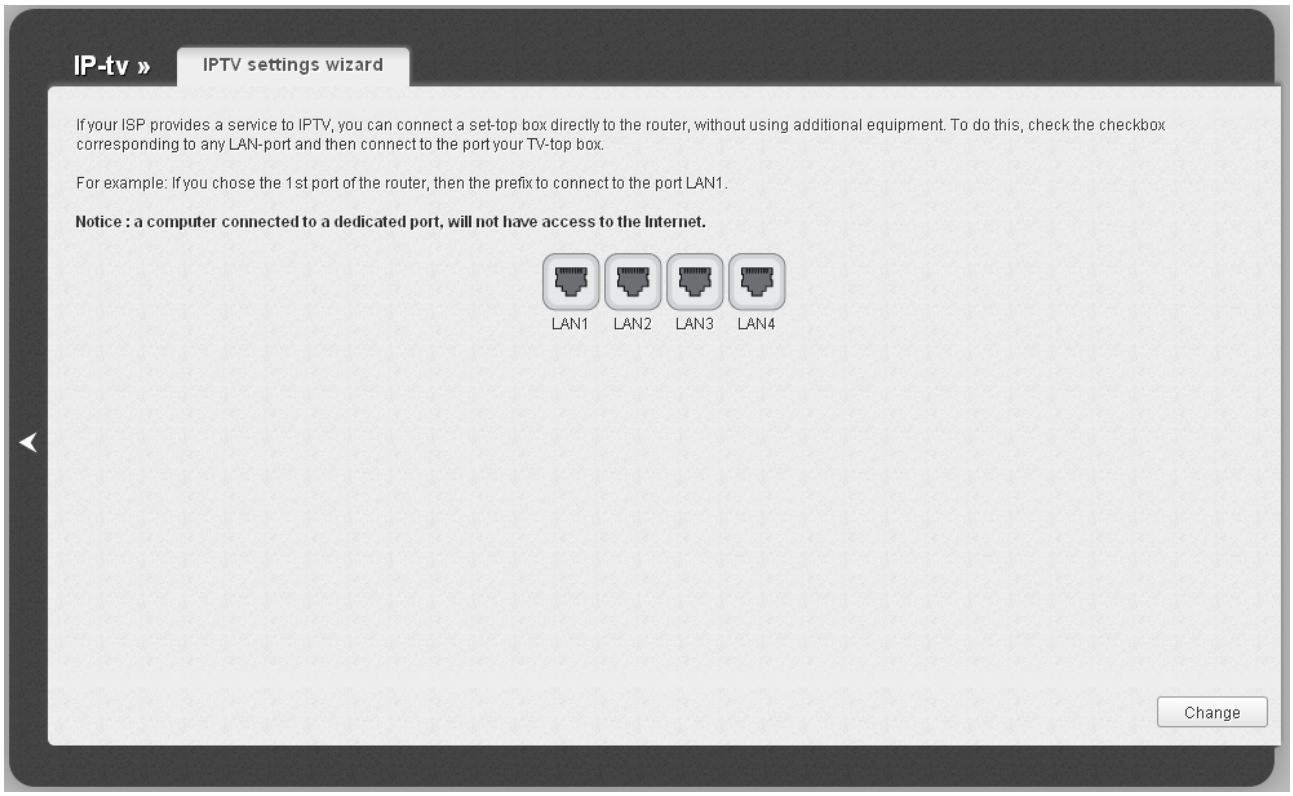
IP-tv »
IPTV settings wizard
If your ISP provides a service to IPTV, you can connect a set-top box directly to the router, without using additional equipment. To do this, check the checkbox corresponding to any LAN-port and then connect to the port your TV-top box.
For example: If you chose the 1 st port of the router, then the prefix to connect to the port LAN1.
Notice : a computer connected to a dedicated port, will not have access to the Internet.
LAN1
LAN2
LAN3
LAN4
Change

Figure 63. The page for selecting a LAN port to connect an IPTV set-top box.

On the opened page, select the LAN port of the router to which you will connect your IPTV set-top box and click the **Change** button. After that you will get to the quick settings page.

If in the future you need to disconnect your IPTV set-top box from the specified LAN port and connect to it a computer, on the current page deselect the LAN port and click the **Change** button.

If for accessing the Internet and IPTV services your ISP uses virtual local area networks with identifiers (VLAN ID), to configure access to the IPTV service, proceed to the **Advanced / VLAN** page, create a group of ports with the required value of the **VLAN ID** parameter, **Transparent** type, and the port to which the set-top box will be connected (see the ***VLAN*** section, page 133, for a detailed description of the elements from the page).

Status

The pages of this section display data on the current state of the router:

- network statistics
- IP addresses leased by the DHCP server
- the routing table
- data on devices connected to the router's network and its web-based interface.

Network Statistics

On the **Status / Network statistics** page, you can view statistics for all connections existing in the system (WAN connections, LAN, WLAN). For each connection the following data are displayed: name and state (when the connection is on, its name is highlighted in green, when the connection is off, its name is highlighted in red), IP address and subnet mask, gateway (if the connection is established), MAC address, MTU value, and volume of data received and transmitted (with increase of the volume the units of measurement are changed automatically: byte, Kbyte, Mbyte, Gbyte).

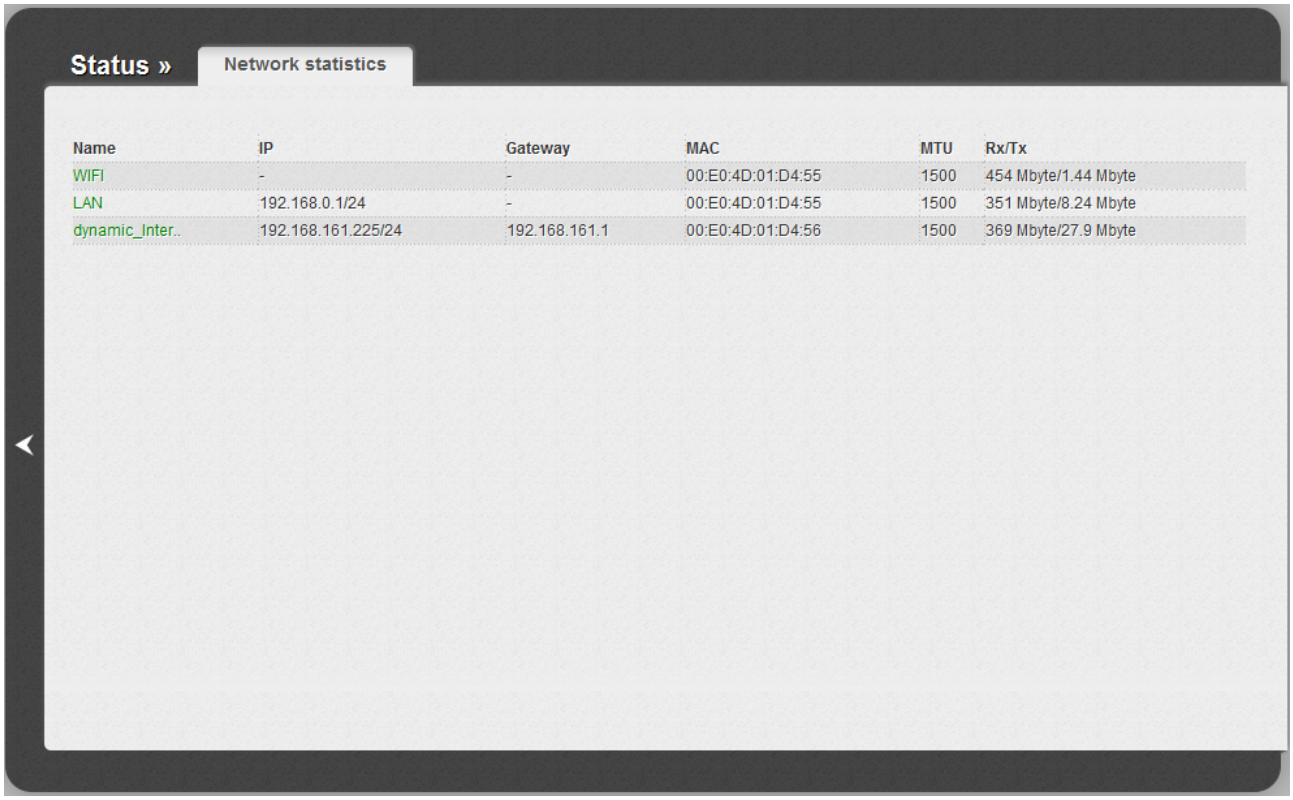

*Figure 64. The **Status / Network statistics** page.*

DHCP

The **Status / DHCP** page displays the information on computers that have been identified by hostnames and MAC addresses and have got IP addresses from the DHCP server of the device, as well as the IP address expiration periods (the lease time).

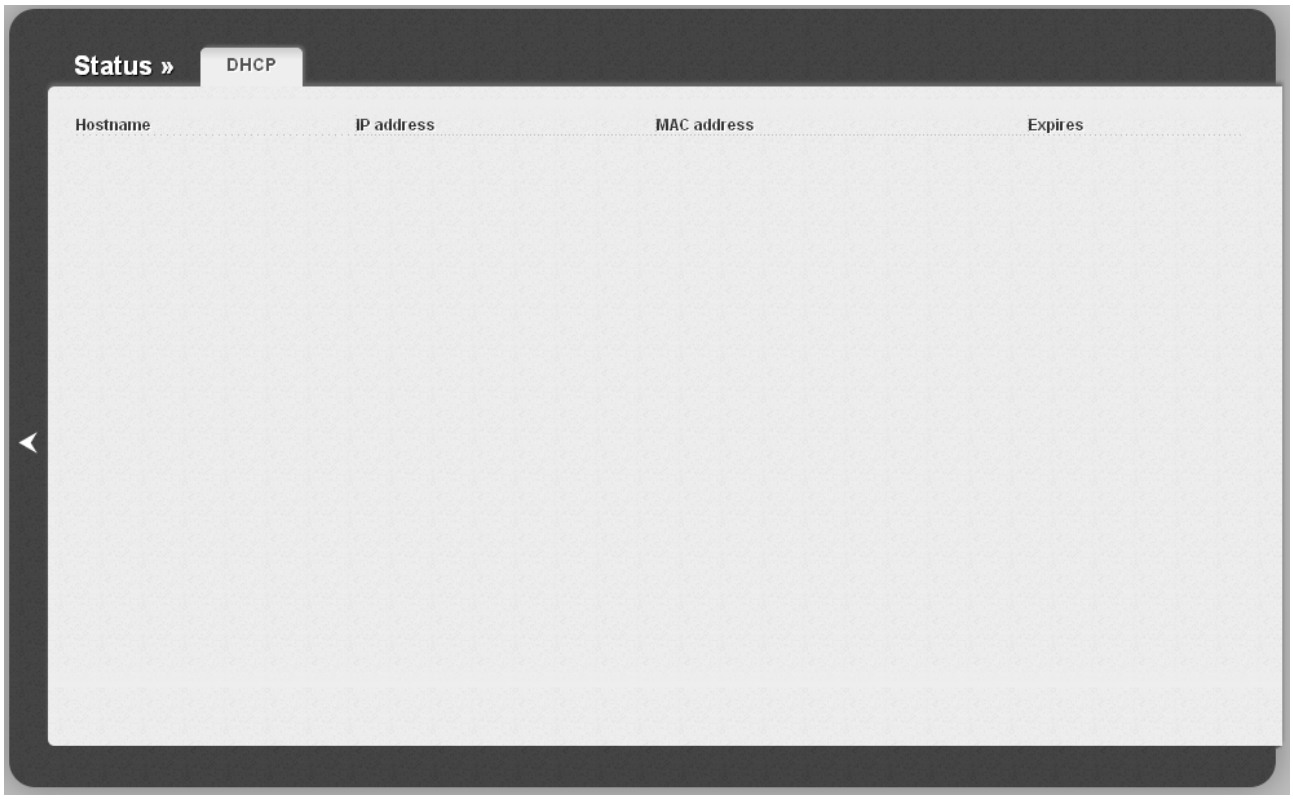

*Figure 65. The **Status / DHCP** page.*

Routing Table

The **Status / Routing table** page displays the information on routes. The table contains destination IP addresses, gateways, subnet masks, and other data.

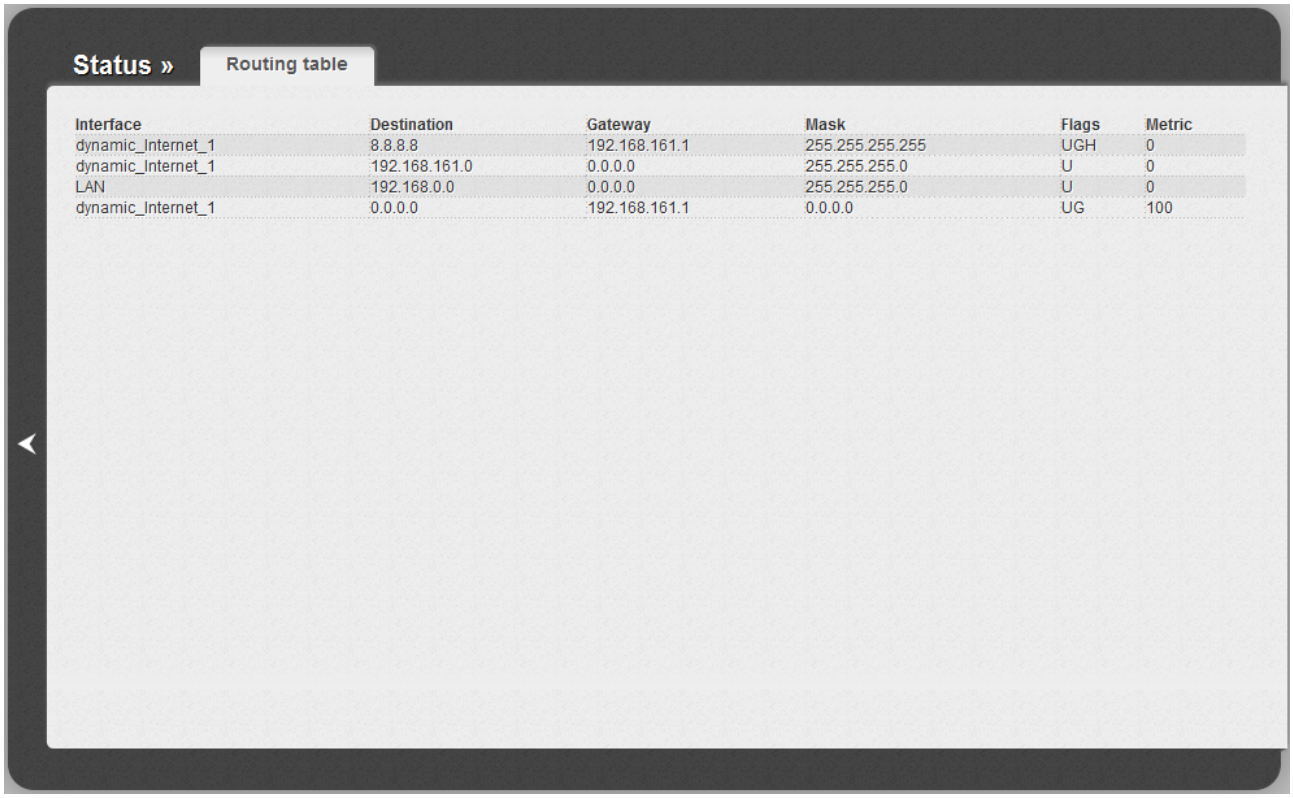

*Figure 66. The **Status / Routing table** page.*

Clients

On the **Status / Clients** page, you can view the list of devices connected to the router and devices accessing its web-based interface.

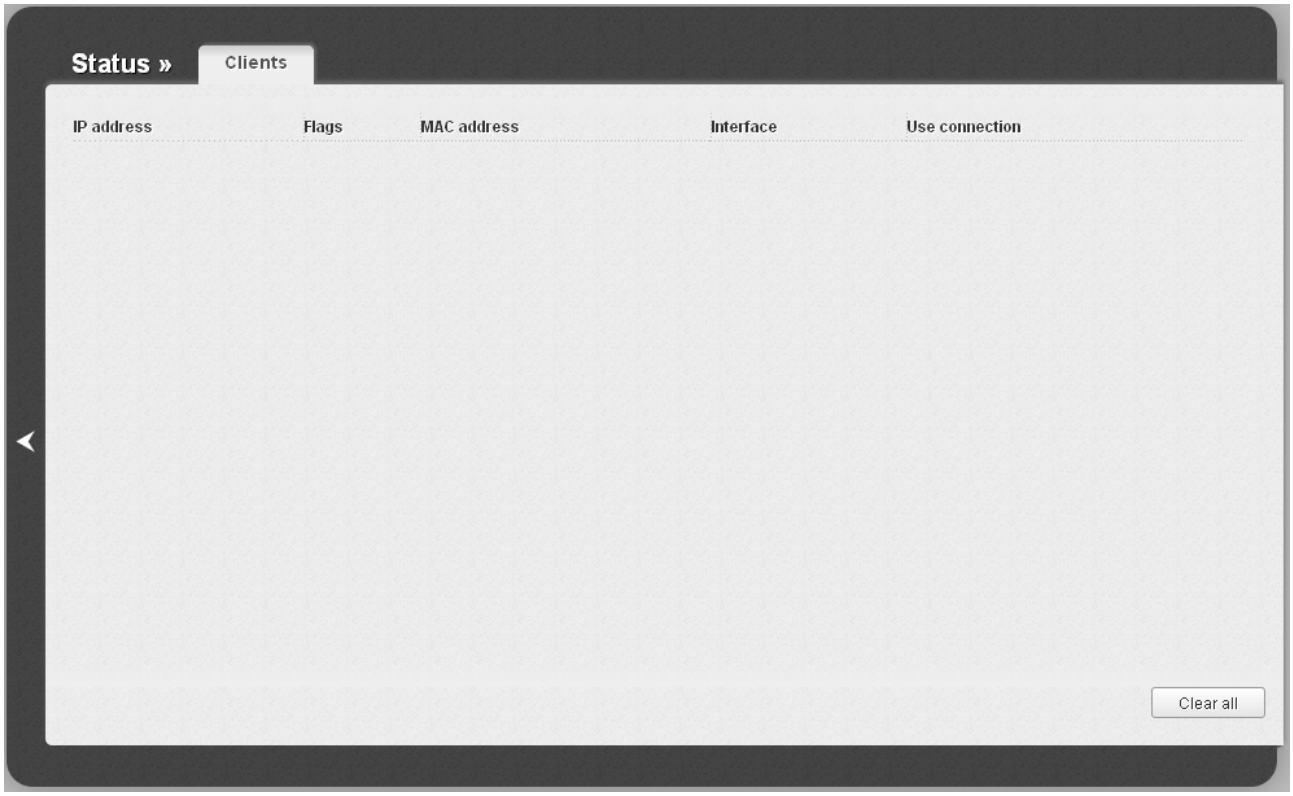

*Figure 67. The **Status / Clients** page.*

For each device the following data are displayed: the IP address, the MAC address, and the interface to which the device is connected.

The **Clear all** button allows to clear the router's ARP table. It includes the MAC addresses of the devices connected to the router before and IP addresses assigned to them. The MAC addresses of the devices connected to the router in the bridge mode are not deleted.

Net

In this menu you can configure basic parameters of the router's local area network and configure connection to the Internet (a WAN connection).

WAN

On the **Net / WAN** page, you can create and edit connections used by the router.

By default, the **WAN** connection is configured in the system. It is assigned to the **INTERNET** port of the router. You can edit this connection or delete it.

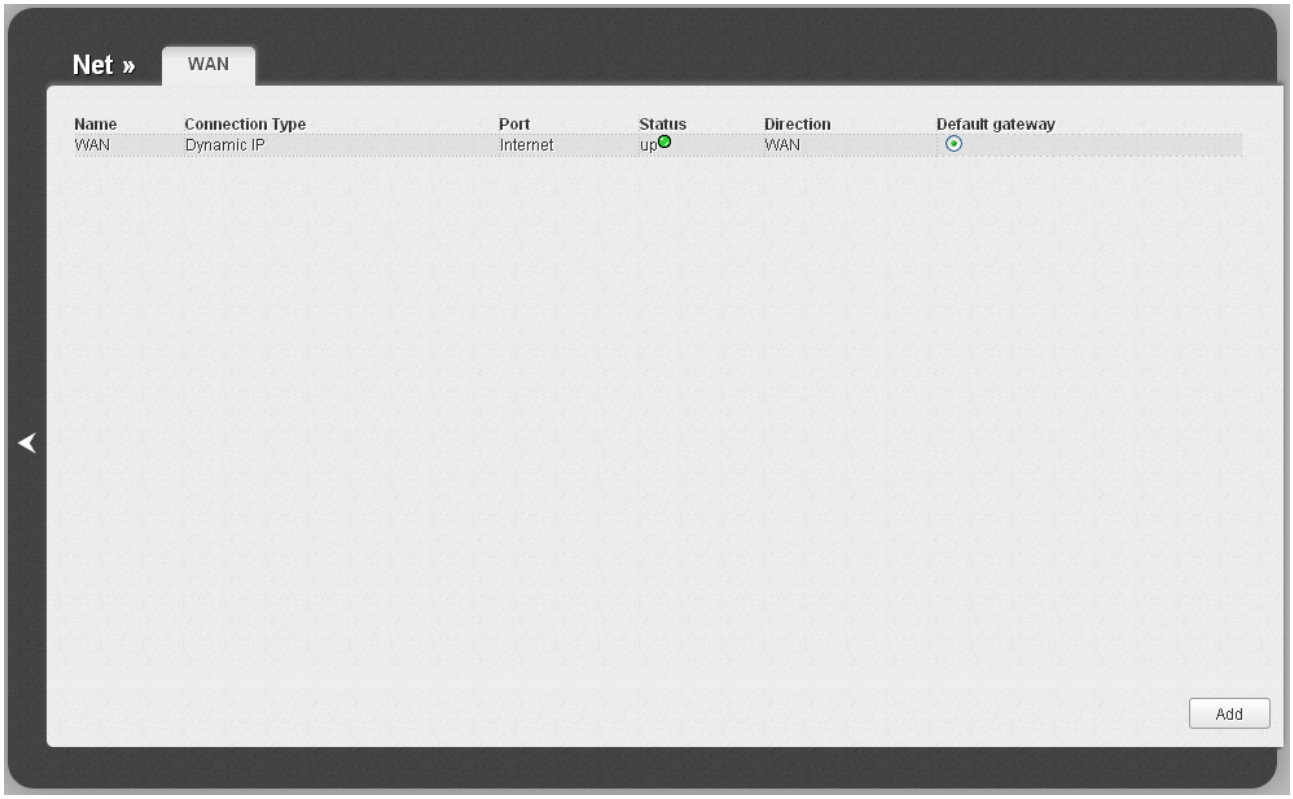

*Figure 68. The **Net / WAN** page.*

To create a new connection, click the **Add** button. On the page displayed, specify the relevant values.

To edit an existing connection, left-click the relevant line in the table. On the page displayed, change the parameters and click the **Save** button.

To delete an existing connection, left-click the relevant line in the table. On the page displayed, click the **Delete** button.

To use one of existing WAN connections as a default gateway, select the choice of the **Default gateway** radio button located in the line corresponding to this connection.

Creating PPPoE WAN Connection

To create a connection of the PPPoE type, click the **Add** button on the **Net / WAN** page. On the opened page, select the **PPPoE** value from the **Connection Type** drop-down list and specify the needed values.

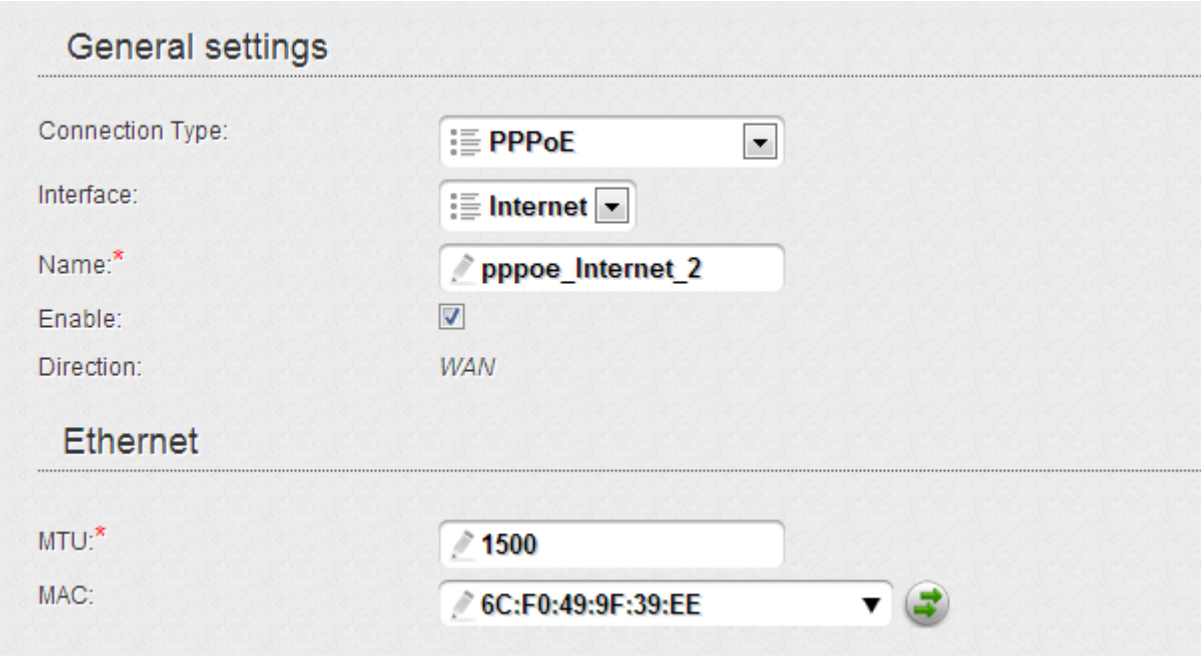

*Figure 69. The page for creating a new connection. The **General settings** and **Ethernet** sections.*

Parameter	Description
General settings	
Interface	A physical or virtual interface to which the new connection will be assigned.
Name	A name for connection for easier identification.
Enable	Select the checkbox to enable the connection.
Direction	The direction of this connection.
Ethernet	
MTU	The maximum size of units transmitted by the interface.

Parameter	Description
MAC	A MAC address assigned to the interface. This parameter is mandatory if your ISP uses MAC address binding. In the field, enter the MAC address registered by your ISP upon concluding the agreement. You can click the **Clone MAC Address** button ( ) to set the MAC address of the network interface card (of the computer that is being used to configure the router at the moment) as the MAC address of the WAN interface. Also you can set the address of a device connected to the router's LAN at the moment. To do this, select the relevant value from the drop-down list (the field will be filled in automatically).

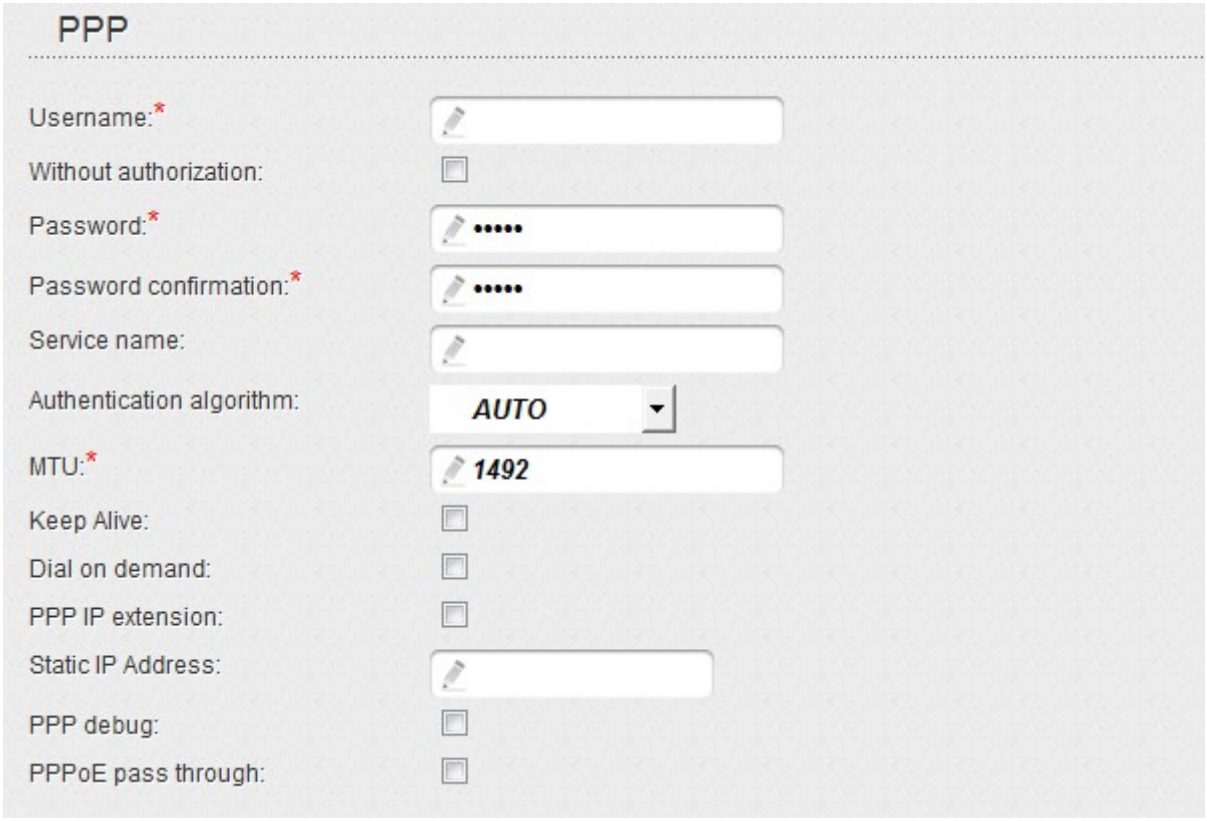

*Figure 70. The page for creating a new connection. The **PPP** section.*

Parameter	Description
PPP	
Username	A username (login) to access the Internet.
Without authorization	Select the checkbox if you don't need to enter a username and password to access the Internet.
Password	A password to access the Internet.
Password confirmation	The confirmation of the entered password (to avoid mistypes).
Service name	The name of the PPPoE authentication server.
Authentication algorithm	Select a required authentication method from the drop-down list or leave the **AUTO** value.
MTU	The maximum size of units transmitted by the interface.
Keep Alive	Select the checkbox if you want the router to keep you connected to your ISP even when the connection has been inactive for a specified period of time. When the checkbox is selected, the **LCP interval** and **LCP fails** fields are available. Specify the required values.
Dial on demand	Select the checkbox if you want the router to establish connection to the Internet on demand. In the **Maximum idle time** field, specify a period of inactivity (in seconds) after which the connection should be terminated.
PPP IP extension	This option is used by some ISPs. Contact your ISP to clarify if this checkbox needs to be enabled.
Static IP Address	Fill in the field if you want to use a static IP address to access the Internet.
PPP debug	Select the checkbox if you want to log all data on PPP connection debugging.
PPPoE pass through	Select the checkbox if you want to allow PPPoE clients of computers from your LAN to connect to the Internet through this PPPoE connection of the router.

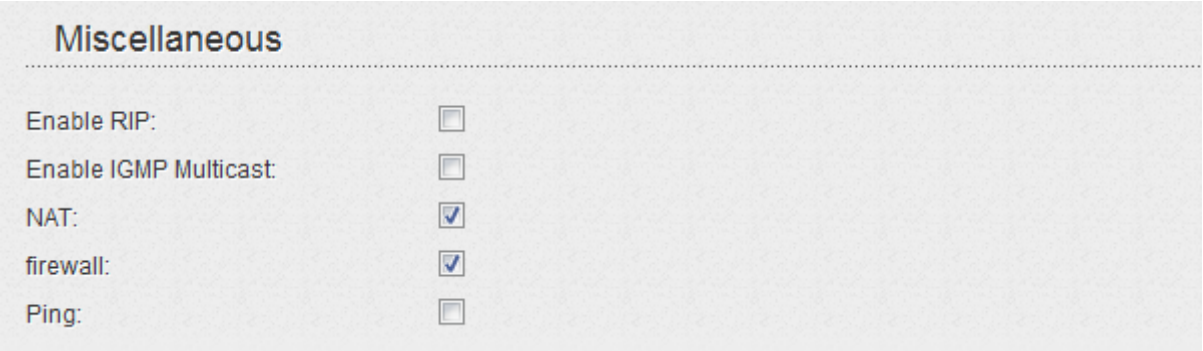

*Figure 71. The page for creating a new connection. The **Miscellaneous** section.*

Parameter	Description
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
Enable IGMP Multicast	Select the checkbox to allow multicast traffic from the external network (e.g. video streaming) to be received.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

When all needed settings are configured, click the **Save** button.

Creating Static IP WAN Connection

To create a connection of the Static IP type, click the **Add** button on the **Net / WAN** page. On the opened page, select the **Static IP** value from the **Connection Type** drop-down list and specify the needed values.

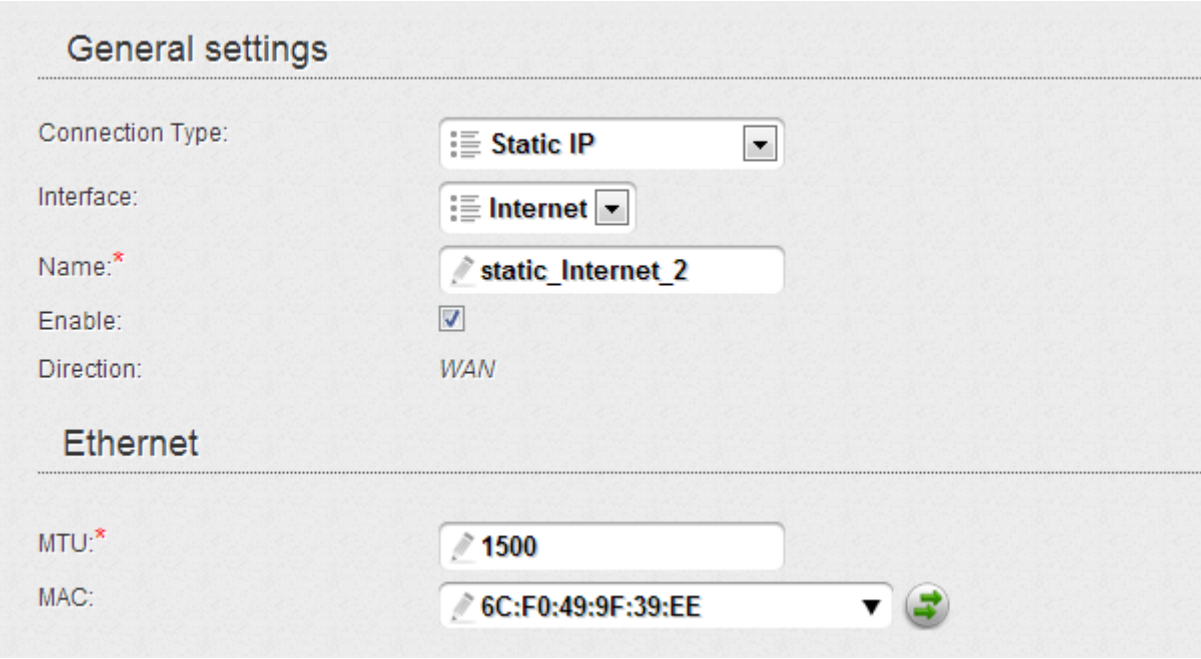

*Figure 72. The page for creating a new connection. The **General settings** and **Ethernet** sections.*

Parameter	Description
General settings	
Interface	A physical or virtual interface to which the new connection will be assigned.
Name	A name for connection for easier identification.
Enable	Select the checkbox to enable the connection.
Direction	The direction of this connection.
Ethernet	
MTU	The maximum size of units transmitted by the interface.

Parameter	Description
MAC	A MAC address assigned to the interface. This parameter is mandatory if your ISP uses MAC address binding. In the field, enter the MAC address registered by your ISP upon concluding the agreement. You can click the **Clone MAC Address** button ( ) to set the MAC address of the network interface card (of the computer that is being used to configure the router at the moment) as the MAC address of the WAN interface. Also you can set the address of a device connected to the router's LAN at the moment. To do this, select the relevant value from the drop-down list (the field will be filled in automatically).

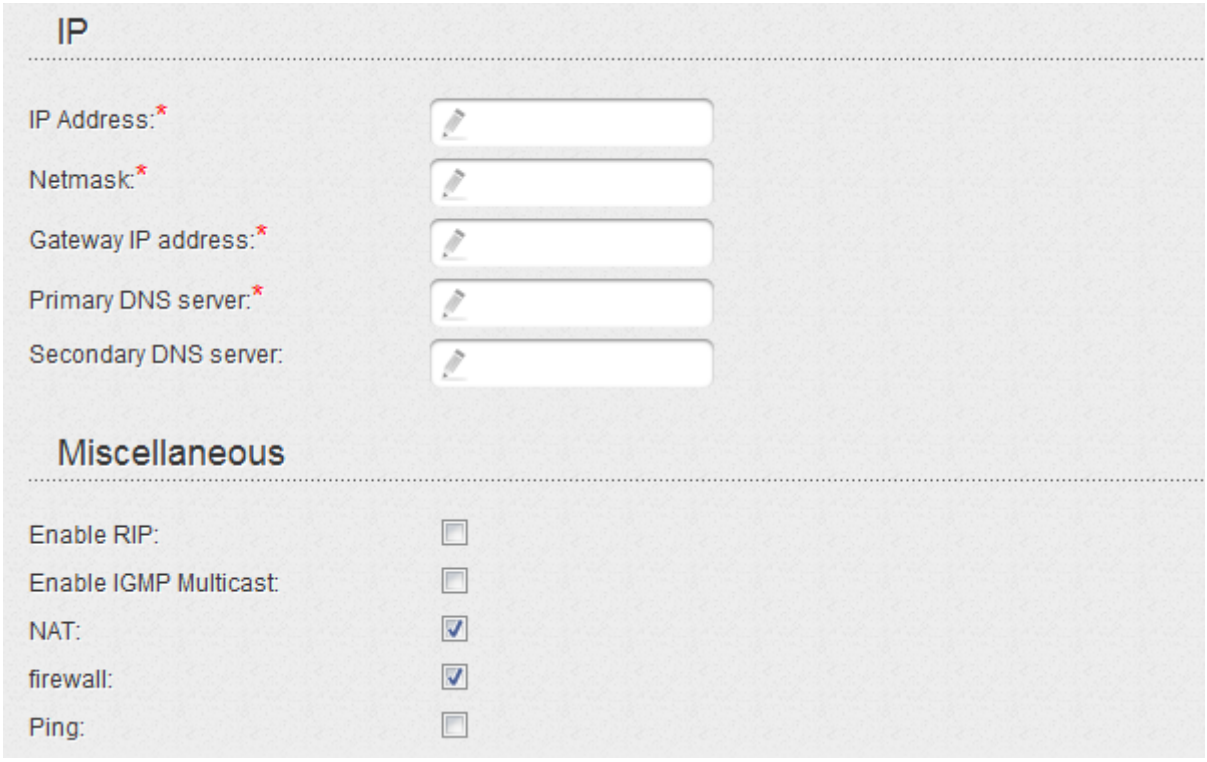

*Figure 73. The page for creating a new connection. The **IP** and **Miscellaneous** sections.*

Parameter	Description
IP	
IP Address	Enter an IP address for this WAN connection.
Netmask	Enter a subnet mask for this WAN connection.
Gateway IP address	Enter an IP address of the gateway used by this WAN connection.
Primary DNS server/ Secondary DNS server	Enter addresses of the primary and secondary DNS servers in the relevant fields.
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
Enable IGMP Multicast	Select the checkbox to allow multicast traffic from the external network (e.g. video streaming) to be received.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

When all needed settings are configured, click the **Save** button.

Creating Dynamic IP WAN Connection

To create a connection of the Dynamic IP type, click the **Add** button on the **Net / WAN** page. On the opened page, select the **Dynamic IP** value from the **Connection Type** drop-down list and specify the needed values.

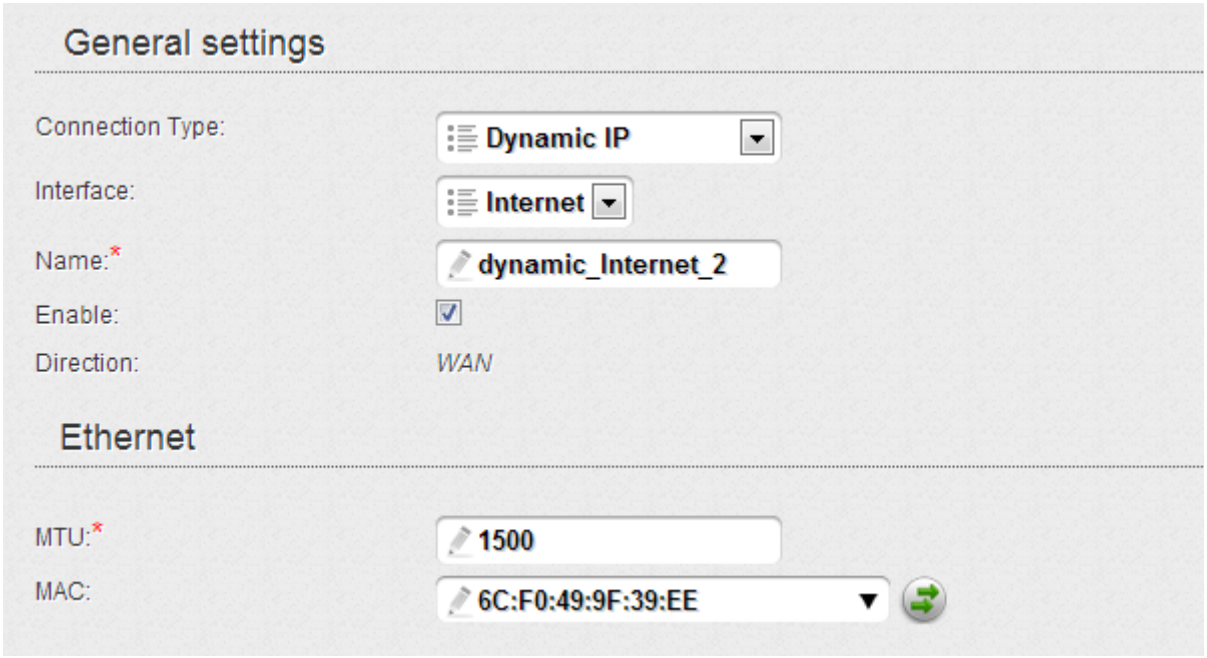

*Figure 74. The page for creating a new connection. The **General settings** and **Ethernet** sections.*

Parameter	Description
General settings	
Interface	A physical or virtual interface to which the new connection will be assigned.
Name	A name for connection for easier identification.
Enable	Select the checkbox to enable the connection.
Direction	The direction of this connection.
Ethernet	
MTU	The maximum size of units transmitted by the interface.

Parameter	Description
MAC	A MAC address assigned to the interface. This parameter is mandatory if your ISP uses MAC address binding. In the field, enter the MAC address registered by your ISP upon concluding the agreement. You can click the **Clone MAC Address** button ( ) to set the MAC address of the network interface card (of the computer that is being used to configure the router at the moment) as the MAC address of the WAN interface. Also you can set the address of a device connected to the router's LAN at the moment. To do this, select the relevant value from the drop-down list (the field will be filled in automatically).

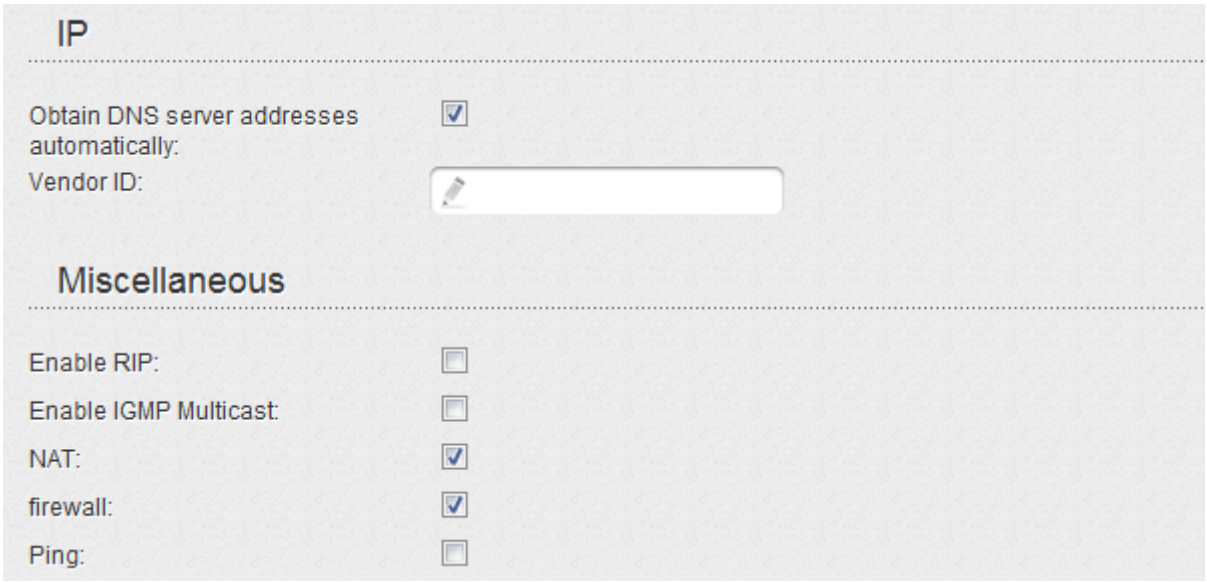

*Figure 75. The page for creating a new connection. The **IP** and **Miscellaneous** sections.*

Parameter	Description
IP	
Obtain DNS server addresses automatically	Select the checkbox to configure automatic assignment of DNS server addresses. If the checkbox is selected, the **Primary DNS server** and **Secondary DNS server** fields are not displayed.
Primary DNS server/ Secondary DNS server	Enter addresses of the primary and secondary DNS servers in the relevant fields.
Vendor ID	The identifier of your ISP. *Optional*.
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
Enable IGMP Multicast	Select the checkbox to allow multicast traffic from the external network (e.g. video streaming) to be received.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

When all needed settings are configured, click the **Save** button.

Creating PPTP + Static IP or L2TP + Static IP WAN Connection

To create a connection of the PPTP + Static IP or L2TP + Static IP type, click the **Add** button on the **Net / WAN** page. On the opened page, select the relevant value from the **Connection Type** drop-down list and specify the needed values.

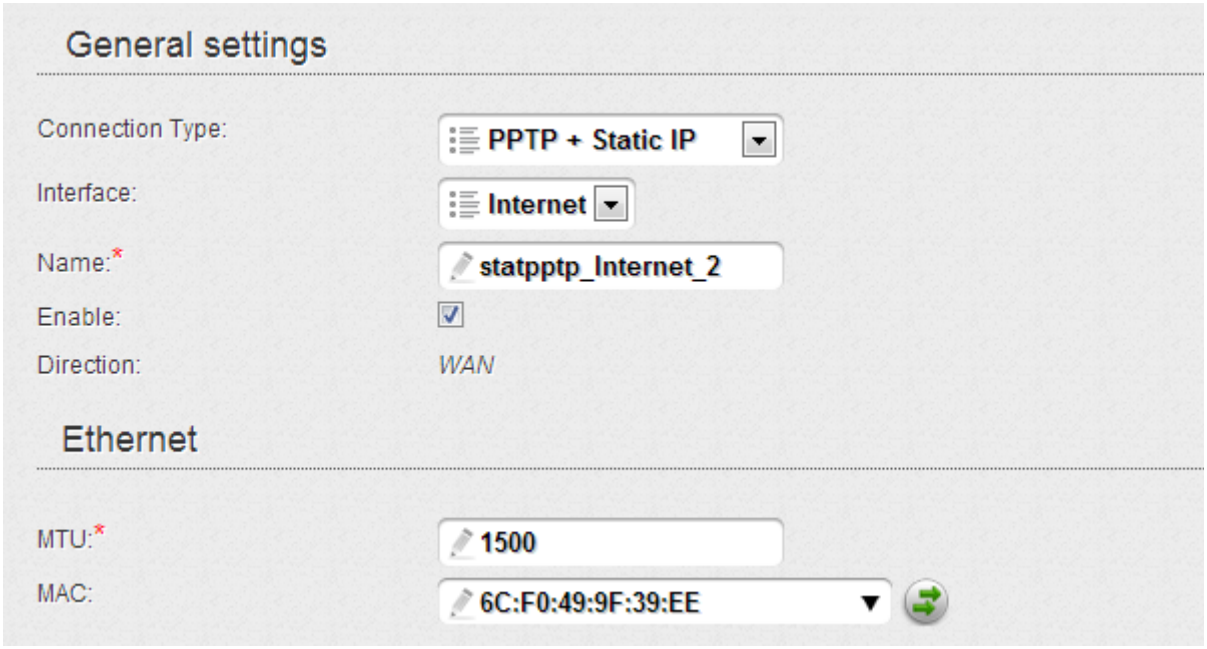

*Figure 76. The page for creating a new connection. The **General settings** and **Ethernet** sections.*

Parameter	Description
General settings	
Interface	A physical or virtual interface to which the new connection will be assigned.
Name	A name for connection for easier identification.
Enable	Select the checkbox to enable the connection.
Direction	The direction of this connection.
Ethernet	
MTU	The maximum size of units transmitted by the interface.

Parameter	Description
MAC	A MAC address assigned to the interface. This parameter is mandatory if your ISP uses MAC address binding. In the field, enter the MAC address registered by your ISP upon concluding the agreement. You can click the **Clone MAC Address** button ( ) to set the MAC address of the network interface card (of the computer that is being used to configure the router at the moment) as the MAC address of the WAN interface. Also you can set the address of a device connected to the router's LAN at the moment. To do this, select the relevant value from the drop-down list (the field will be filled in automatically).

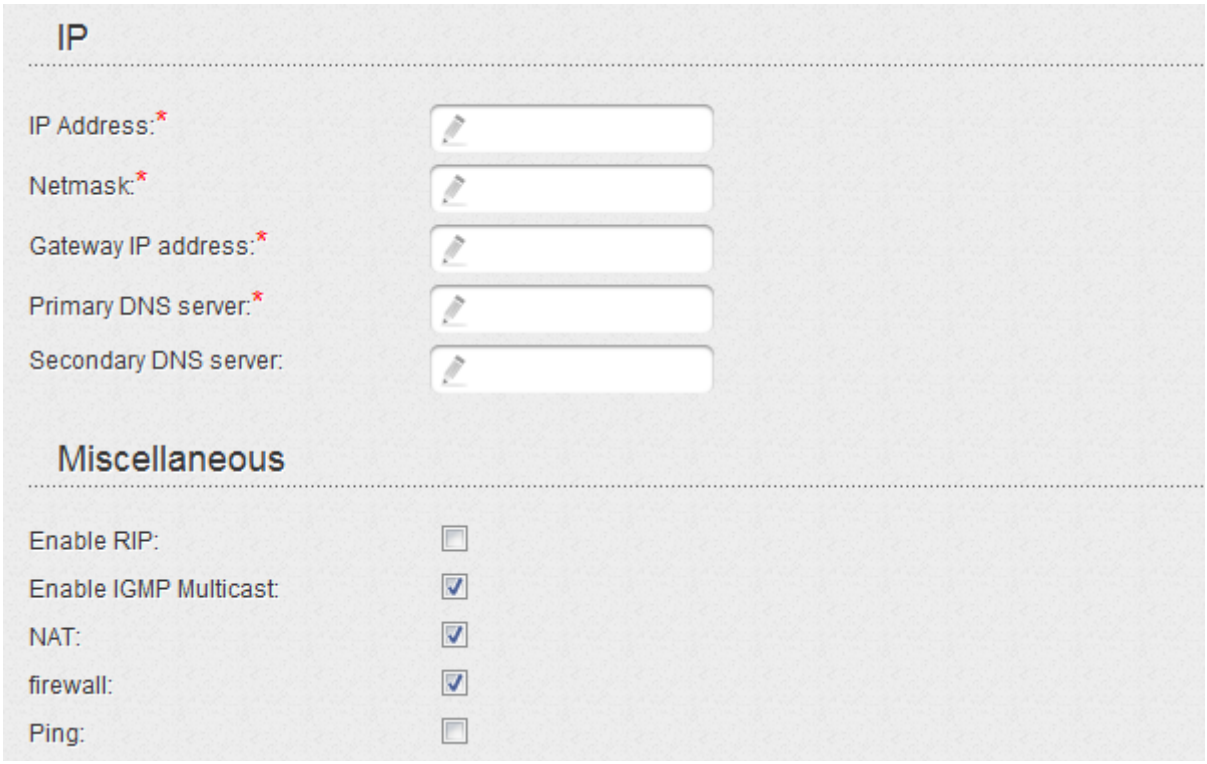

*Figure 77. The page for creating a new connection. The **IP** and **Miscellaneous** sections.*

Parameter	Description
IP	
IP Address	Enter an IP address for this WAN connection.
Netmask	Enter a subnet mask for this WAN connection.
Gateway IP address	Enter an IP address of the gateway used by this WAN connection.

Parameter	Description
Primary DNS server/ Secondary DNS server	Enter addresses of the primary and secondary DNS servers in the relevant fields.
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
Enable IGMP Multicast	Select the checkbox to allow multicast traffic from the external network (e.g. video streaming) to be received.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

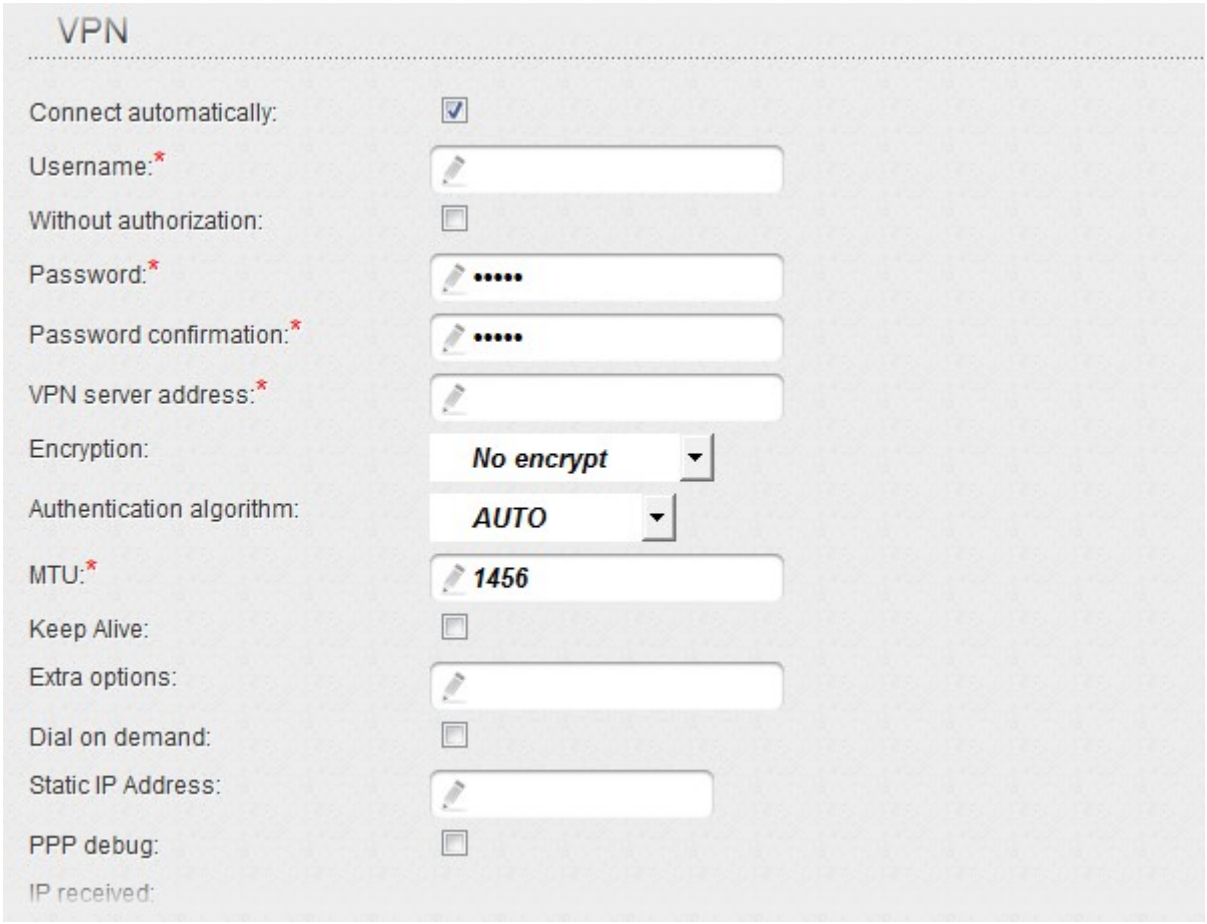

*Figure 78. The page for creating a new connection. The **VPN** section.*

Parameter	Description
VPN	
Connect automatically	Select the checkbox to enable auto-start of the connection upon the boot-up of the router.
Username	A username (login) to access the Internet.
Without authorization	Select the checkbox if you don't need to enter a username and password to access the Internet.
Password	A password to access the Internet.
Password confirmation	The confirmation of the entered password (to avoid mistypes).
VPN server address	The IP or URL address of the PPTP or L2TP authentication server.
Encryption	Select a method of MPPE encryption. • **No encrypt**: MPPE encryption is not applied. • **MPPE 40/128 bit**: MPPE encryption with a 40-bit or 128-bit key is applied. • **MPPE 40 bit**: MPPE encryption with a 40-bit key is applied. • **MPPE 128 bit**: MPPE encryption with a 128-bit key is applied. MPPE encryption can be applied only if the **MS-CHAP, MS-CHAP-V2**, or **AUTO** value is selected from the **Authentication algorithm** drop-down list.
Authentication algorithm	Select a required authentication method from the drop-down list or leave the **AUTO** value.
MTU	The maximum size of units transmitted by the interface.
Keep Alive	Select the checkbox if you want the router to keep you connected to your ISP even when the connection has been inactive for a specified period of time. When the checkbox is selected, the **LCP interval** and **LCP fails** fields are available. Specify the required values.
Extra options	Advanced options of the pppd daemon which need to be specified for this connection. *Optional*.
Dial on demand	Select the checkbox if you want the router to establish connection to the Internet on demand. In the **Maximum idle time** field, specify a period of inactivity (in seconds) after which the connection should be terminated.

Parameter	Description
Static IP Address	Fill in the field if you want to use a static IP address to access the Internet.
PPP debug	Select the checkbox if you want to log all data on PPP connection debugging.
IP received	The IP address assigned by the ISP.

*Figure 79. The page for creating a new connection. The **Miscellaneous** section.*

Parameter	Description
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

When all needed settings are configured, click the **Save** button.

Creating PPTP + Dynamic IP or L2TP + Dynamic IP WAN Connection

To create a connection of the PPTP + Dynamic IP or L2TP + Dynamic IP type, click the **Add** button on the **Net / WAN** page. On the opened page, select the relevant value from the **Connection Type** drop-down list and specify the needed values.

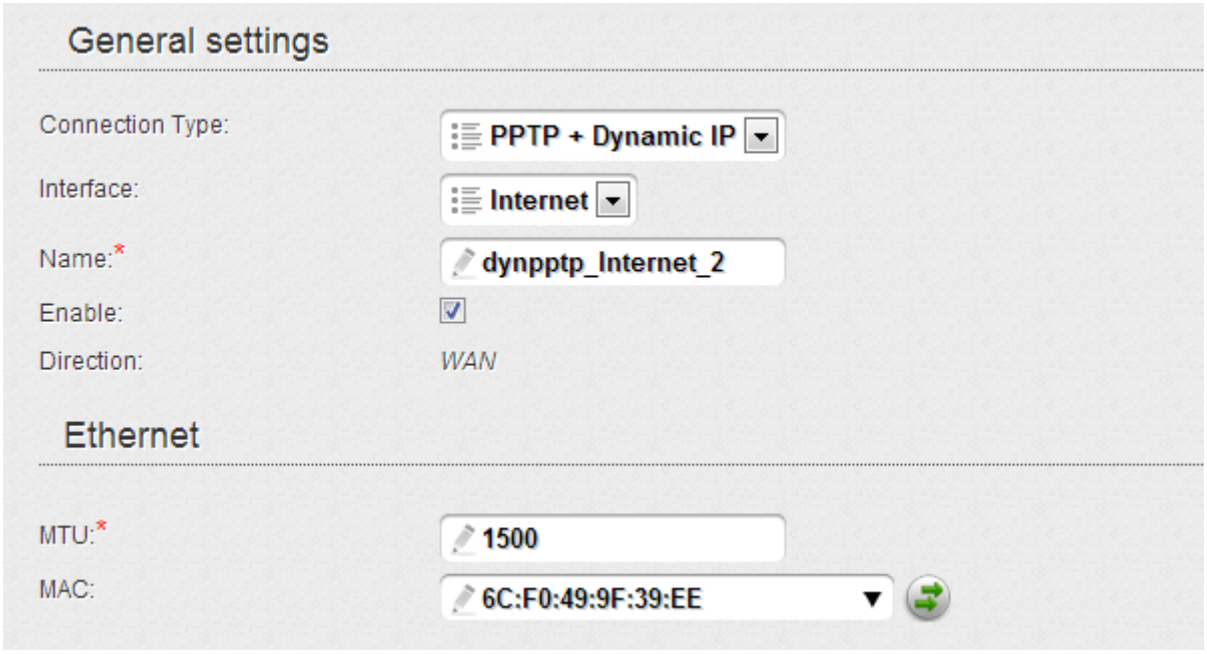

*Figure 80. The page for creating a new connection. The **General settings** and **Ethernet** sections.*

Parameter	Description
General settings	
Interface	A physical or virtual interface to which the new connection will be assigned.
Name	A name for connection for easier identification.
Enable	Select the checkbox to enable the connection.
Direction	The direction of this connection.
Ethernet	
MTU	The maximum size of units transmitted by the interface.

Parameter	Description
MAC	A MAC address assigned to the interface. This parameter is mandatory if your ISP uses MAC address binding. In the field, enter the MAC address registered by your ISP upon concluding the agreement. You can click the **Clone MAC Address** button ( ) to set the MAC address of the network interface card (of the computer that is being used to configure the router at the moment) as the MAC address of the WAN interface. Also you can set the address of a device connected to the router's LAN at the moment. To do this, select the relevant value from the drop-down list (the field will be filled in automatically).

*Figure 81. The page for creating a new connection. The **IP** and **Miscellaneous** sections.*

Parameter	Description
IP	
Obtain DNS server addresses automatically	Select the checkbox to configure automatic assignment of DNS server addresses. If the checkbox is selected, the **Primary DNS server** and **Secondary DNS server** fields are not displayed.
Primary DNS server/ Secondary DNS server	Enter addresses of the primary and secondary DNS servers in the relevant fields.
Vendor ID	The identifier of your ISP. *Optional*.
Miscellaneous	

Parameter	Description
Enable RIP	Select the checkbox to allow using RIP for this connection.
Enable IGMP Multicast	Select the checkbox to allow multicast traffic from the external network (e.g. video streaming) to be received.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

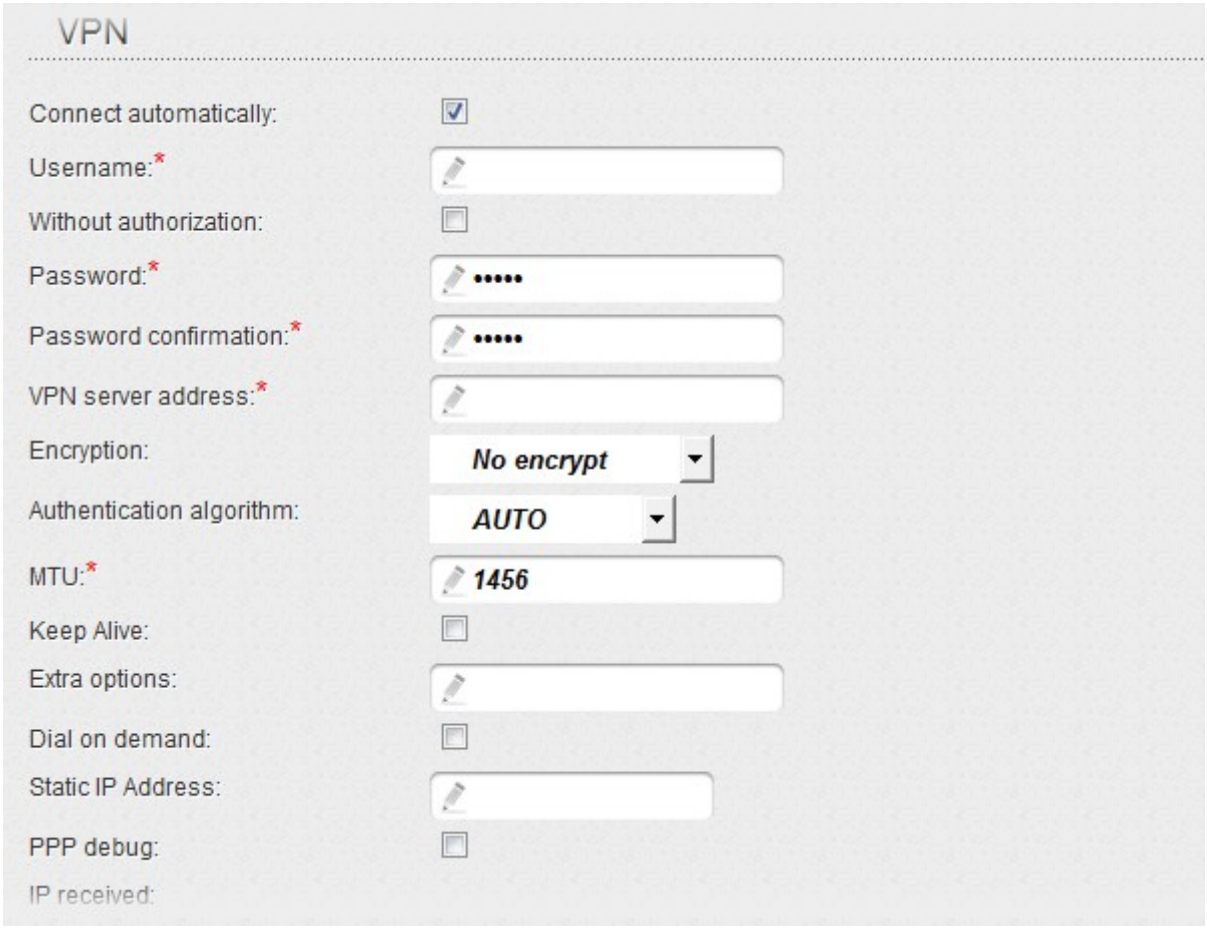

*Figure 82. The page for creating a new connection. The **VPN** section.*

Parameter	Description
VPN	
Connect automatically	Select the checkbox to enable auto-start of the connection upon the boot-up of the router.
Username	A username (login) to access the Internet.
Without authorization	Select the checkbox if you don't need to enter a username and password to access the Internet.
Password	A password to access the Internet.
Password confirmation	The confirmation of the entered password (to avoid mistypes).
VPN server address	The IP or URL address of the PPTP or L2TP authentication server.
Encryption	Select a method of MPPE encryption. • **No encrypt**: MPPE encryption is not applied. • **MPPE 40/128 bit**: MPPE encryption with a 40-bit or 128-bit key is applied. • **MPPE 40 bit**: MPPE encryption with a 40-bit key is applied. • **MPPE 128 bit**: MPPE encryption with a 128-bit key is applied. MPPE encryption can be applied only if the **MS-CHAP, MS-CHAP-V2**, or **AUTO** value is selected from the **Authentication algorithm** drop-down list.
Authentication algorithm	Select a required authentication method from the drop-down list or leave the **AUTO** value.
MTU	The maximum size of units transmitted by the interface.
Keep Alive	Select the checkbox if you want the router to keep you connected to your ISP even when the connection has been inactive for a specified period of time. When the checkbox is selected, the **LCP interval** and **LCP fails** fields are available. Specify the required values.
Extra options	Advanced options of the pppd daemon which need to be specified for this connection. *Optional*.
Dial on demand	Select the checkbox if you want the router to establish connection to the Internet on demand. In the **Maximum idle time** field, specify a period of inactivity (in seconds) after which the connection should be terminated.

Parameter	Description
Static IP Address	Fill in the field if you want to use a static IP address to access the Internet.
PPP debug	Select the checkbox if you want to log all data on PPP connection debugging.
IP received	The IP address assigned by the ISP.

*Figure 83. The page for creating a new connection. The **Miscellaneous** section.*

Parameter	Description
Miscellaneous	
Enable RIP	Select the checkbox to allow using RIP for this connection.
NAT	Select the checkbox if you want one WAN IP address to be used for all computers of your LAN.
Firewall	Select the checkbox to enable protection against ARP and DDoS attacks.
Ping	Select the checkbox to allow the router to answer ping requests from the external network through this connection. For security reasons, it is recommended not to select this checkbox.

When all needed settings are configured, click the **Save** button.

LAN

To configure the router's local interface, proceed to the **Net / LAN** page.

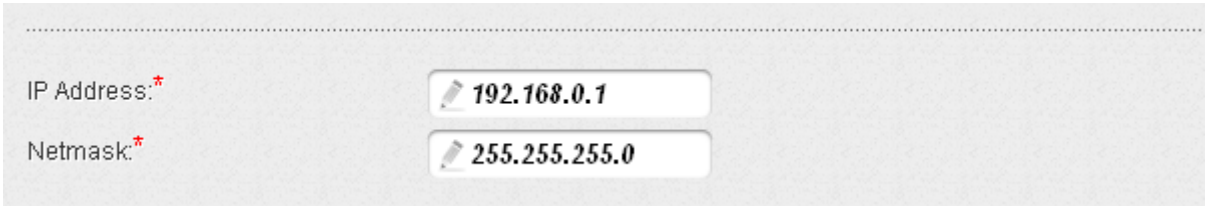

Figure 84. Basic settings of the local interface.

If needed, edit the basic settings of the local interface.

Parameter	Description
IP Address	The IP address of the router in the local subnet. By default, the following value is specified: `192.168.0.1`.
Netmask	The mask of the local subnet. By default, the following value is specified: `255.255.255.0`.

When needed settings are configured, click the **Save** button.

In the **DHCP server** section, you can configure the built-in DHCP server of the router.

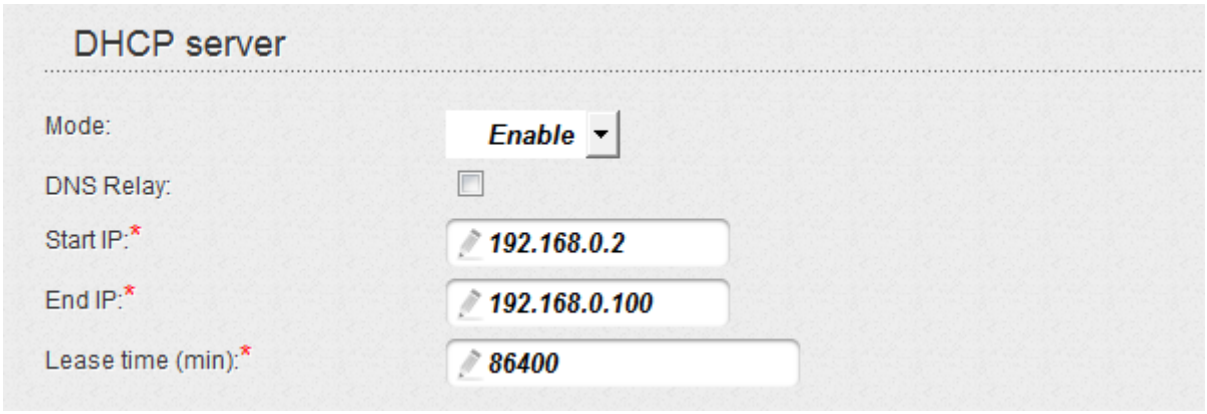

Figure 85. The section for configuring the DHCP server.

Parameter	Description
Mode	An operating mode of the router's DHCP server. **Enable**: the router assigns IP addresses to clients automatically in accordance with the specified parameters. When this value is selected, the **DNS Relay**, **Start IP**, **End IP**, and the **Lease time** fields are displayed on the page. **Disable**: the router's DHCP server is disabled, clients' IP addresses are assigned manually. **Relay**: an external DHCP server is used to assign IP addresses to clients. When this value is selected, the **External DHCP server IP** field is displayed on the page.
DNS Relay	Select the checkbox so that the devices connected to the router obtain the address of the router as the DNS server address. Deselect the checkbox so that the devices connected to the router obtain the address transmitted by the ISP or specified on the **Advanced / DNS** page as the DNS server address.
Start IP	The start IP address of the address pool used by the DHCP server to distribute IP addresses to clients.
End IP	The end IP address of the address pool used by the DHCP server to distribute IP addresses to clients.
Lease time	The lifetime of IP addresses leased by the DHCP server. At the end of this period the leased IP address is revoked and can be distributed to another device, unless the previous device has confirmed the need to keep the address.
External DHCP server IP	The IP address of the external DHCP server which assigns IP addresses to the router's clients.

When all needed settings are configured, click the **Save** button.

In the **Static DHCP** section, you can specify MAC address and IP address pairs (set a fixed IP address in the local area network for a device with a certain MAC address). The router assigns IP addresses in accordance with the specified pairs only when the DHCP server is enabled (in the **DHCP server** section, in the **Mode** drop-down list, the **Enable** value is selected).

Figure 86. The section for creating MAC-IP pairs.

To create a MAC-IP pair, click the **Add** button. In the **IP** field, enter an IP address which will be assigned to the device from the LAN, then in the **MAC** field, enter the MAC address of this device. In the **Host** field, specify a network name of the device for easier identification (*optional*).

Also you can create a MAC-IP pair for a device connected to the router's LAN at the moment. To do this, select the relevant value from the **Known IP/MAC** addresses drop-down list (the **IP** and **MAC** fields will be filled in automatically).

When all needed MAC-IP pairs are specified, click the **Save** button.

Existing MAC-IP pairs are displayed in the table of the **Static DHCP** section. To remove a pair, select the checkbox in the relevant line in the table and click the **Remove** button. Then click the **Save** button.

Wi-Fi

In this menu you can specify all needed settings for your wireless network.

Basic Settings

On the **Wi-Fi / Basic settings** page, you can enable your wireless local area network (WLAN) and configure its basic parameters. To configure the 2.4GHz band or 5GHz band, proceed to the relevant tab.

2.4GHz Band

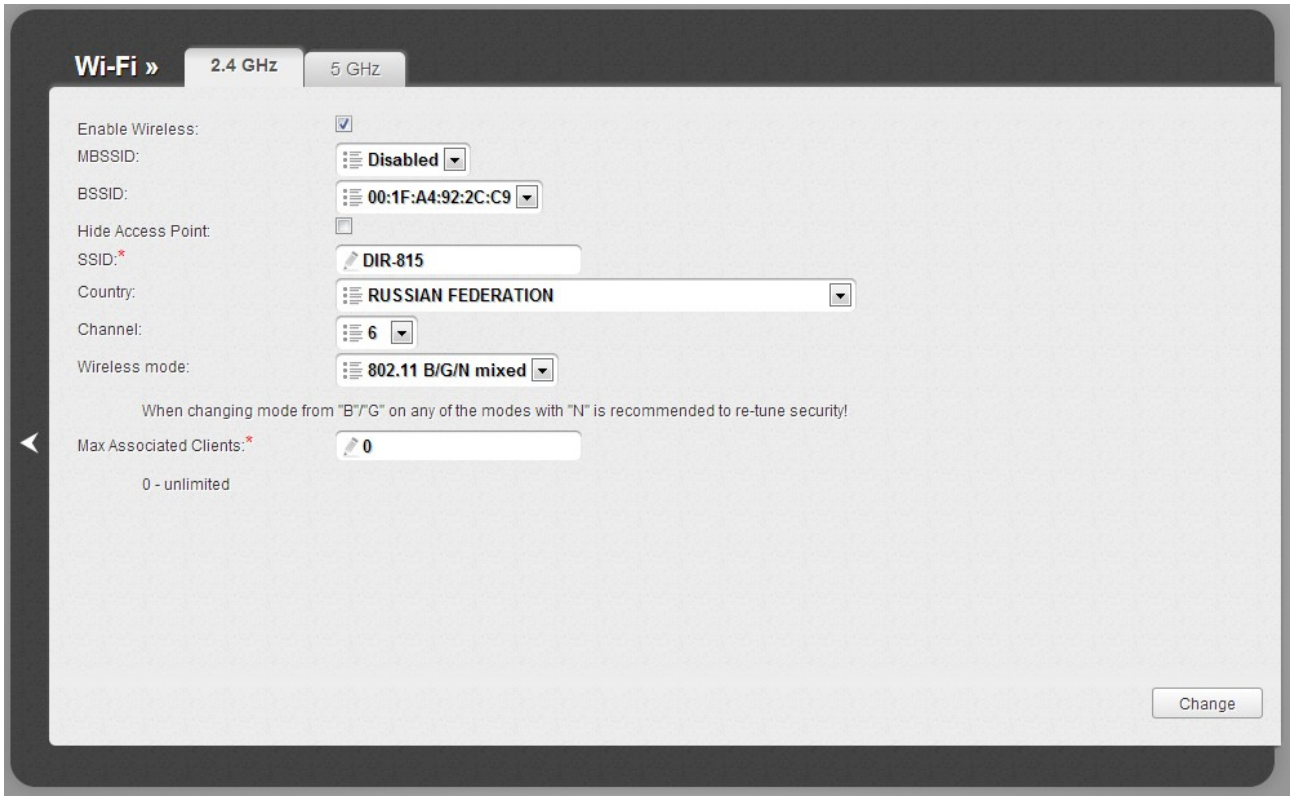

Figure 87. Basic settings of the wireless LAN in the 2.4GHz band.

Parameter	Description
Enable Wireless	The checkbox enables Wi-Fi connections in the 2.4GHz. If you want to disable your WLAN in this band, deselect the checkbox.
BSSID	The unique identifier for your Wi-Fi network (for the 2.4GHz and 5GHz band). You cannot change the value of this parameter, it is determined in the device's internal settings.
Hide Access Point	If the checkbox is selected, other users cannot see your Wi-Fi network. (It is recommended not to select this checkbox in order to simplify initial configuration of your WLAN.)

Parameter	Description
SSID	A name for the WLAN. By default, the value **DIR-815** is specified. It is recommended to specify another name for the network upon initial configuration (use digits and Latin characters).
Country	The country you are in. Select a value from the drop-down list.
Channel	The wireless channel number. When the **auto** value is selected, the router itself chooses the channel with the least interference.
Wireless mode	Operating mode of the wireless network of the router. This parameter defines standards of the devices that will be able to use this band of your wireless network. Select a value from the drop-down list.
Max Associated Clients	The maximum number of devices connected to the wireless network of the router. When the value **0** is specified, the device does not limit the number of connected clients.

When you have configured the parameters, click the **Change** button.

5GHz Band

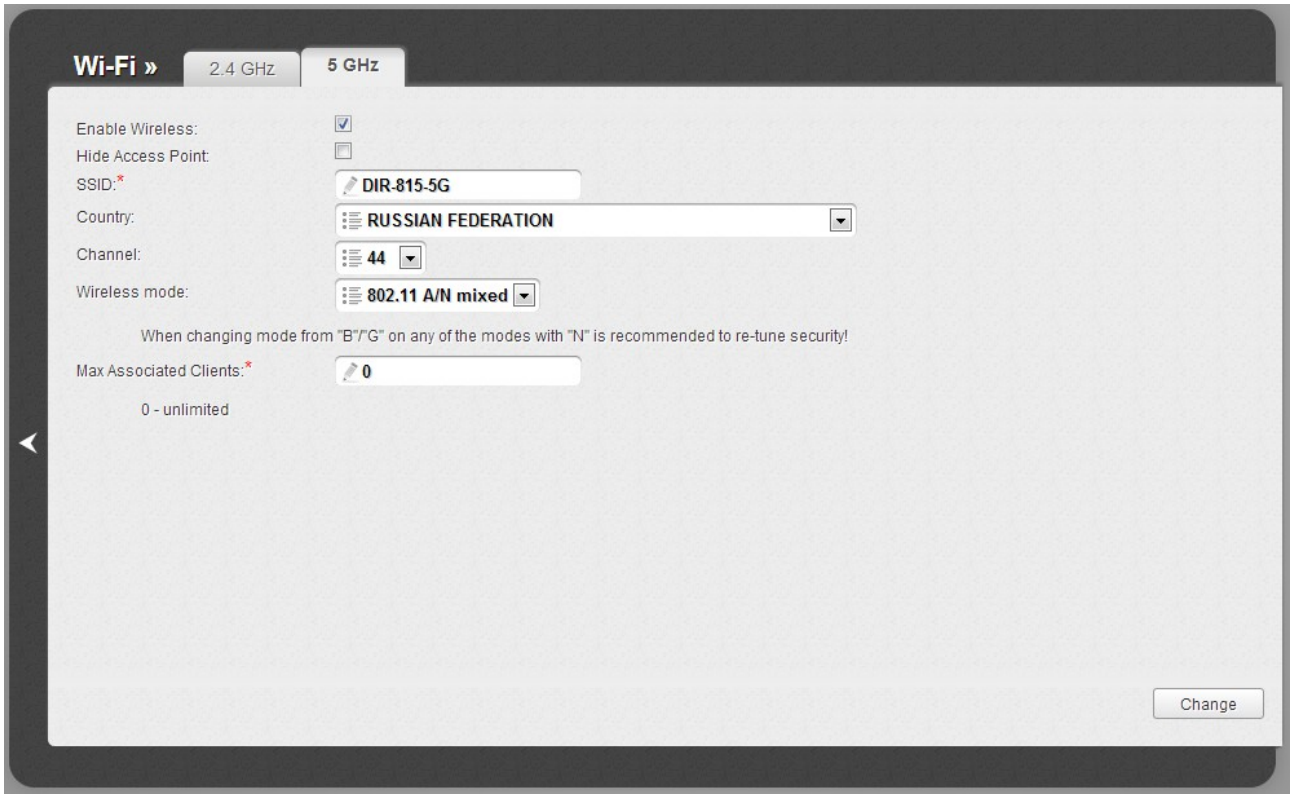

Figure 88. Basic settings of the wireless LAN in the 5GHz band.

Parameter	Description
Enable Wireless	The checkbox enables Wi-Fi connections in the 5GHz. If you want to disable your WLAN in this band, deselect the checkbox.
Hide Access Point	If the checkbox is selected, other users cannot see your Wi-Fi network. (It is recommended not to select this checkbox in order to simplify initial configuration of your WLAN.)
SSID	A name for the WLAN. By default, the value `DIR-815-5G` is specified. It is recommended to specify another name for the network upon initial configuration (use digits and Latin characters).
Country	The country you are in. Select a value from the drop-down list.
Channel	The wireless channel number. By default, channel 44 is specified.
Wireless mode	Operating mode of the wireless network of the router. This parameter defines standards of the devices that will be able to use this band of your wireless network. Select a value from the drop-down list.
Max Associated Clients	The maximum number of devices connected to the wireless network of the router. When the value `0` is specified, the device does not limit the number of connected clients.

When you have configured the parameters, click the **Change** button.

Security Settings

On the **Wi-Fi / Security settings** page, you can modify security settings of the WLAN. To configure the 2.4GHz band or 5GHz band, proceed to the relevant tab.

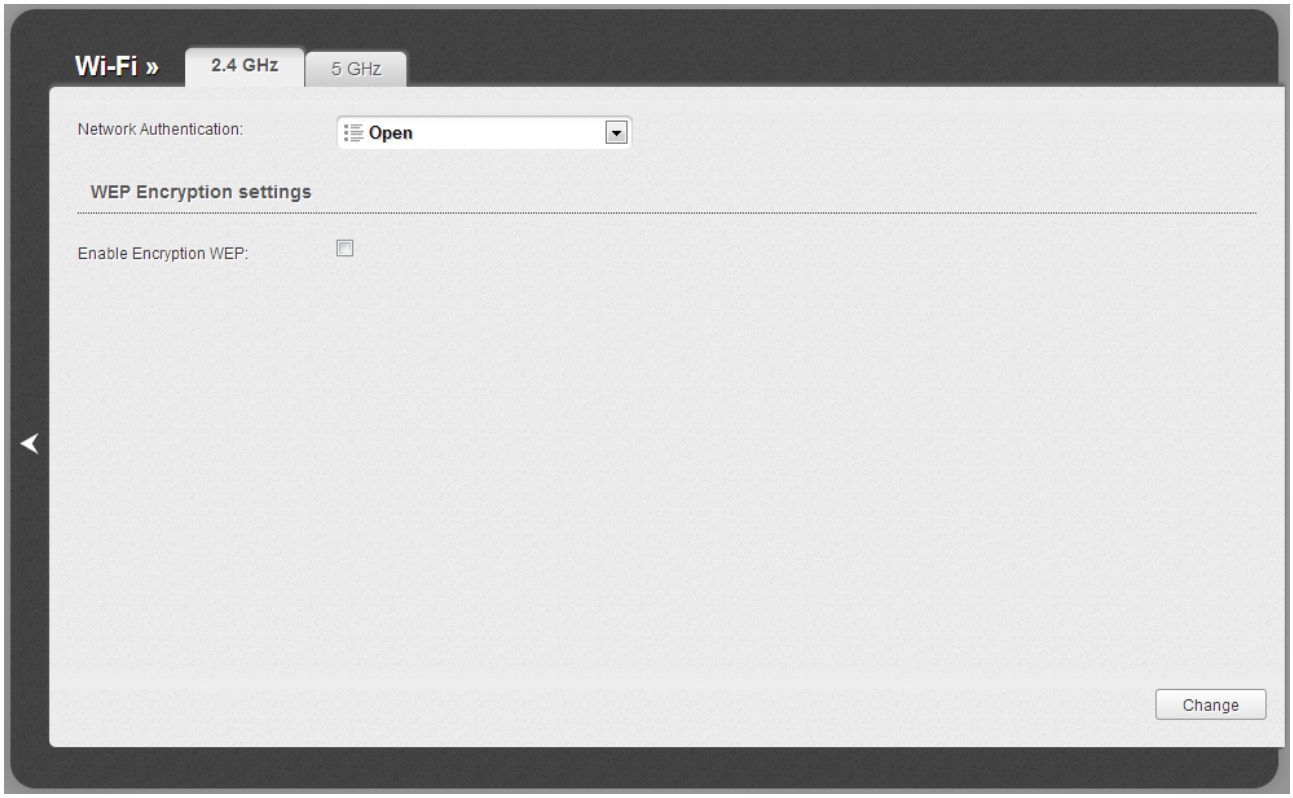

Figure 89. The default security settings.

By default, the **Open** network authentication type with no encryption is specified for both bands of the WLAN.

! The default security settings do not provide sufficient protection for the WLAN. Please, specify your own security settings for the WLAN.

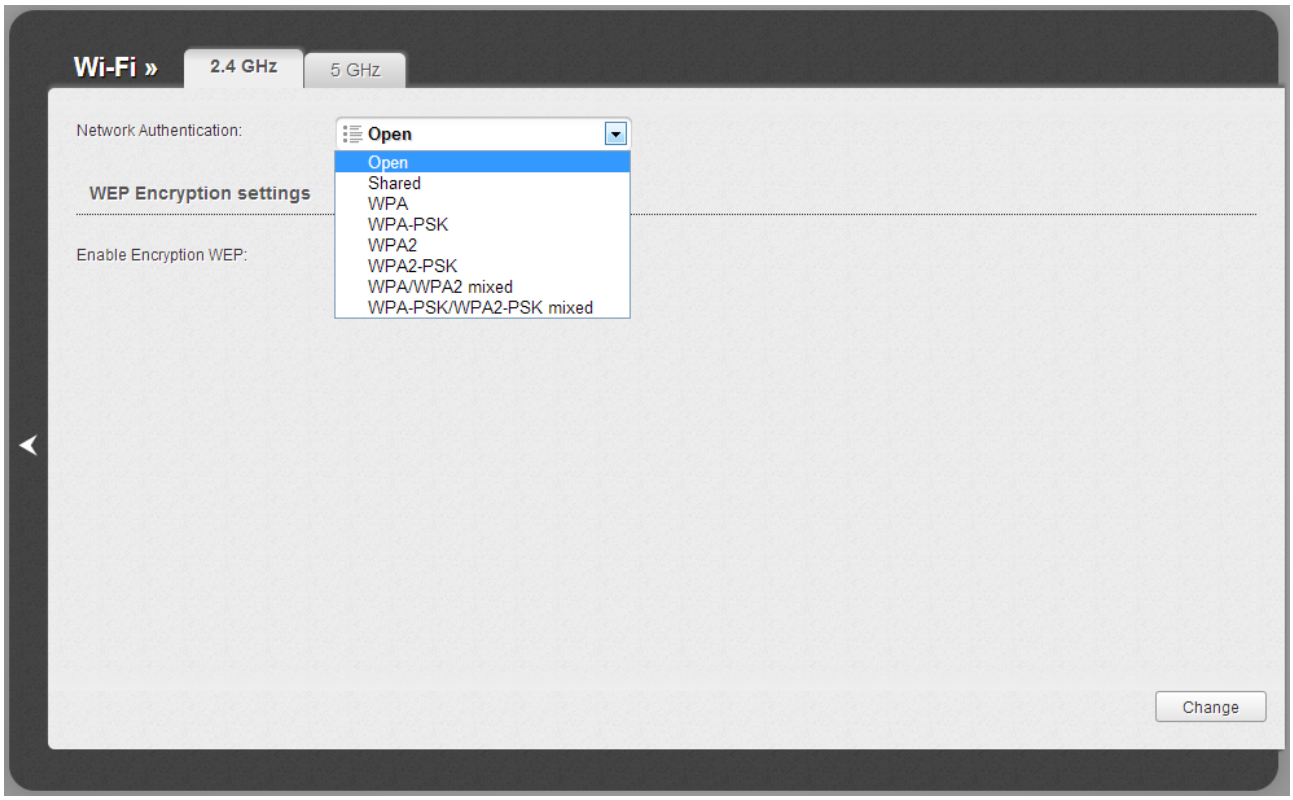

Figure 90. Network authentication types supported by the router.

The router supports the following authentication types:

Authentication type	Description
Open	Open authentication (with WEP encryption for wireless network modes not supporting 802.11n devices).
Shared	Shared key authentication with WEP encryption. This authentication type is not available when on the **Wi-Fi / Basic settings** page, on the relevant band tab, in the **Wireless mode** drop-down list, a mode supporting 802.11n devices is selected.
WPA	WPA-based authentication using a RADIUS server.
WPA-PSK	WPA-based authentication using a PSK.
WPA2	WPA2-based authentication using a RADIUS server.
WPA2-PSK	WPA2-based authentication using a PSK.
WPA/WPA2 mixed	A mixed type of authentication. When this value is selected, devices using the **WPA** authentication type and devices using the **WPA2** authentication type can connect to the WLAN of the router.
WPA-PSK/WPA2-PSK mixed	A mixed type of authentication. When this value is selected, devices using the **WPA-PSK** authentication type and devices using the **WPA2-PSK** authentication type can connect to the WLAN of the router.

The **WPA**, **WPA2**, and **WPA/WPA2 mixed** authentication types require a RADIUS server.

When the **Open** or **Shared** value is selected, the **WEP Encryption settings** section is displayed (the section is unavailable for the wireless network operating modes which support the standard 802.11n):

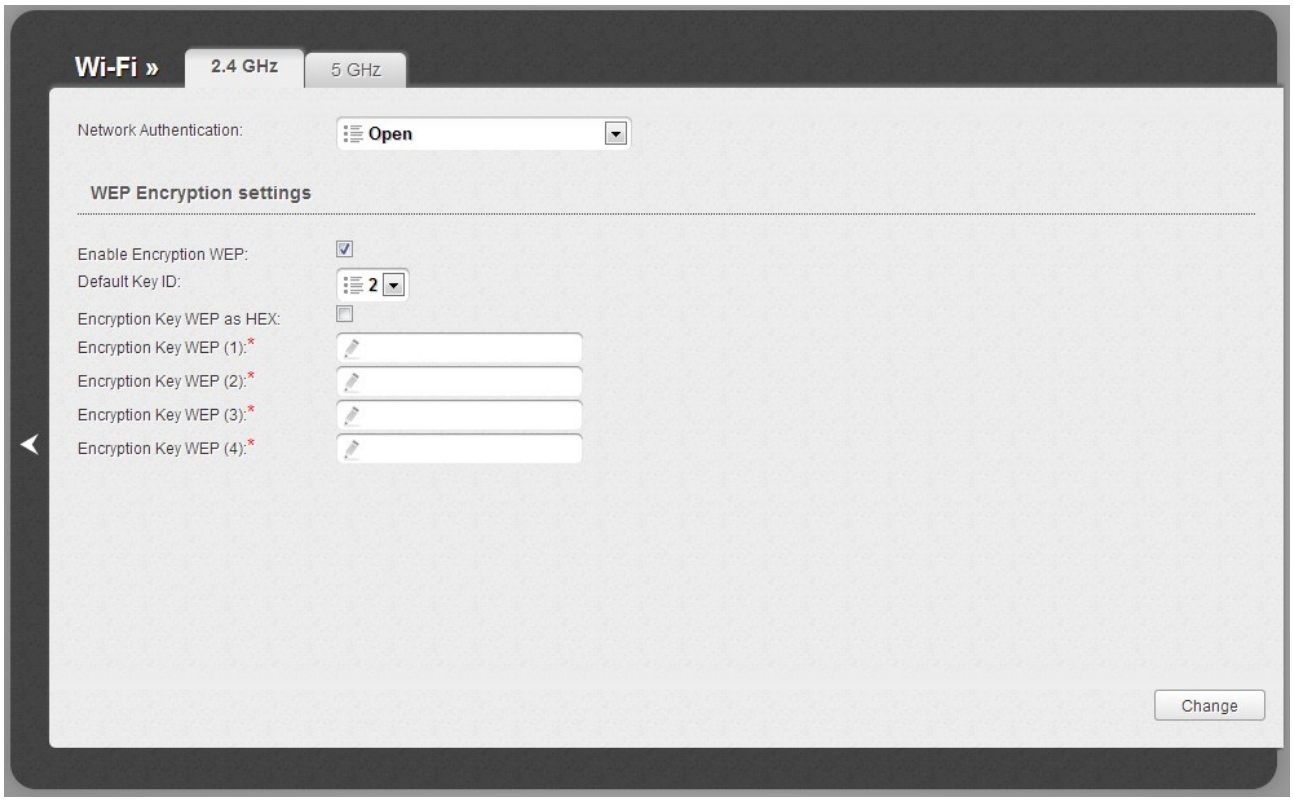

*Figure 91. The **Open** value is selected from the **Network Authentication** drop-down list.*

Parameter	Description
Enable Encryption WEP	The checkbox activating WEP encryption. When the checkbox is selected, the **Default Key ID** field, the **Encryption Key WEP as HEX** checkbox, and four **Encryption Key WEP** fields are displayed on the page. For the **Shared** authentication type the checkbox is always selected.
Default Key ID	The number of the key (from first to fourth) which will be used for WEP encryption.
Encryption Key WEP as HEX	Select the checkbox to set a hexadecimal number as a key for encryption.
Encryption Key WEP (1-4)	Keys for WEP encryption. The router uses the key selected from the **Default Key ID** drop-down list. It is required to specify all the fields. You can specify keys containing 5 or 13 symbols (use digits and/or Latin characters). If the **Encryption Key WEP as HEX** checkbox is selected, you can specify only keys containing 10 symbols (the digits 0-9 and the characters A-F).

When the **WPA-PSK**, **WPA2-PSK**, or **WPA-PSK/WPA2-PSK mixed** value is selected, the **WPA Encryption settings** section is displayed:

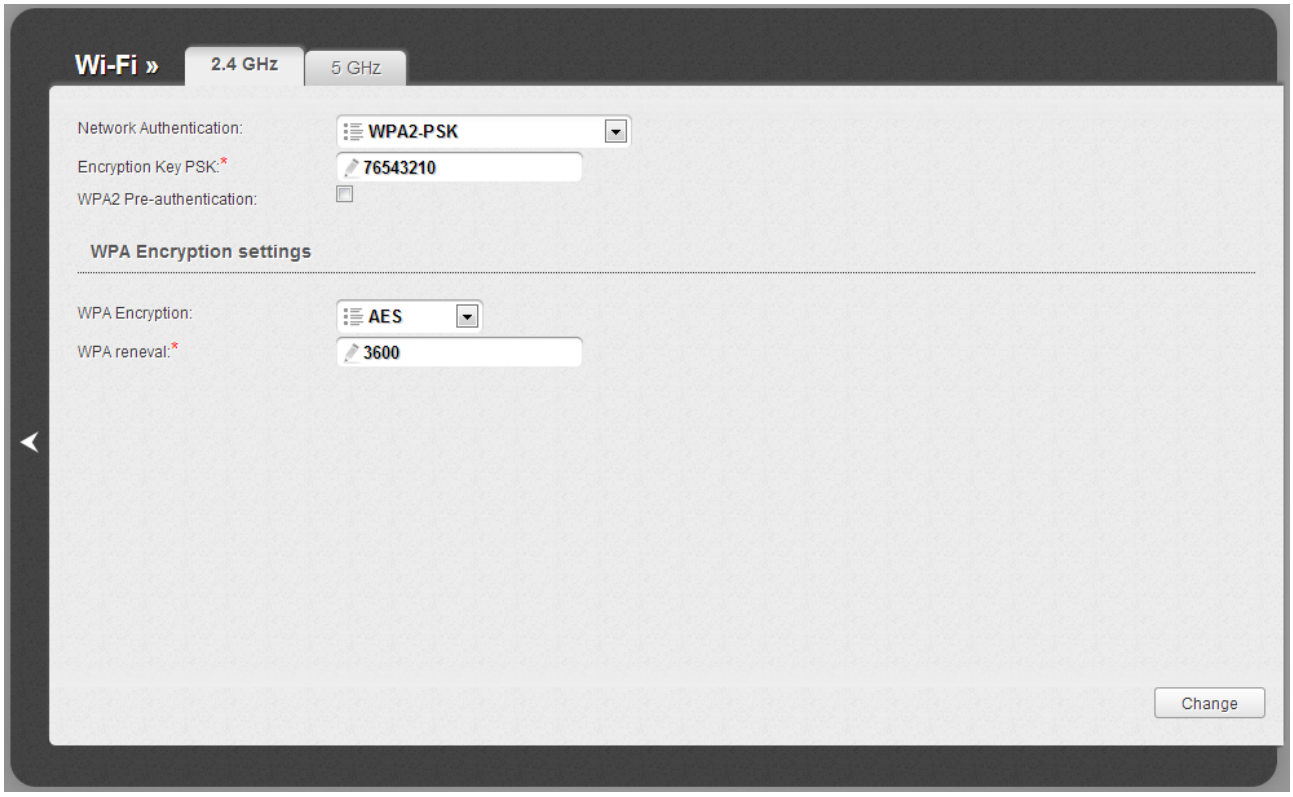

*Figure 92. The **WPA2-PSK** value is selected from the **Network Authentication** drop-down list.*

Parameter	Description
Encryption Key PSK	A key for WPA encryption. The key can contain digits and/or Latin characters.
WPA2 Pre-authentication	The checkbox activating preliminary authentication (displayed only for the **WPA2-PSK** and **WPA-PSK/WPA2-PSK mixed** authentication types).
WPA Encryption	An encryption method: **TKIP**, **AES**, or **TKIP+AES**. For the wireless network operating modes which support 802.11n standard (see the value of the **Wireless mode** drop-down list on the **Wi-Fi / Basic settings** page), the **AES** value is only available.
WPA renewal	The time period (in seconds), at the end of which a new key for WPA encryption is generated. When the value **0** is specified for this field, the key is not renewed.

When the **WPA**, **WPA2**, or **WPA/WPA2 mixed** value is selected, the **RADIUS settings** and **WPA Encryption settings** sections are available:

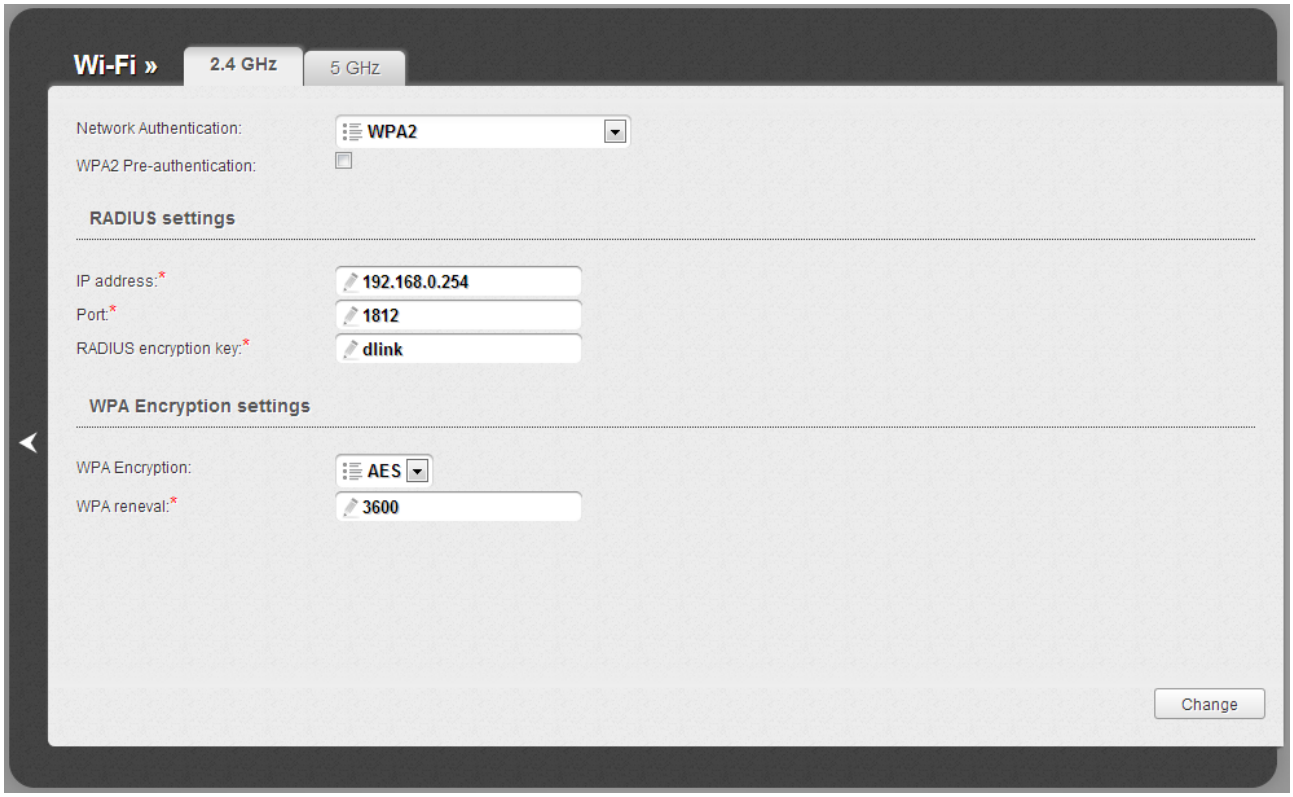

*Figure 93. The **WPA2** value is selected from the **Network Authentication** drop-down list.*

Parameter	Description
WPA2 Pre-authentication	The checkbox activating preliminary authentication (displayed only for the **WPA2** and **WPA/WPA2 mixed** authentication types).
IP address	The IP address of the RADIUS server.
Port	A port of the RADIUS server.
RADIUS encryption key	The password which the router uses for communication with the RADIUS server (the value of this parameter is specified in the RADIUS server settings).
WPA Encryption	An encryption method: **TKIP**, **AES**, or **TKIP+AES**.
WPA renewal	The time period (in seconds), at the end of which a new key for WPA encryption is generated. When the value **0** is specified for this field, the key is not renewed.

When you have configured the parameters, click the **Change** button.

MAC Filter

On the **Wi-Fi / MAC Filter** page, you can define a set of MAC addresses of devices which will be allowed to access the WLAN, or define MAC addresses of devices which will not be allowed to access the WLAN. Settings specified on this page are applied to both bands of the WLAN.

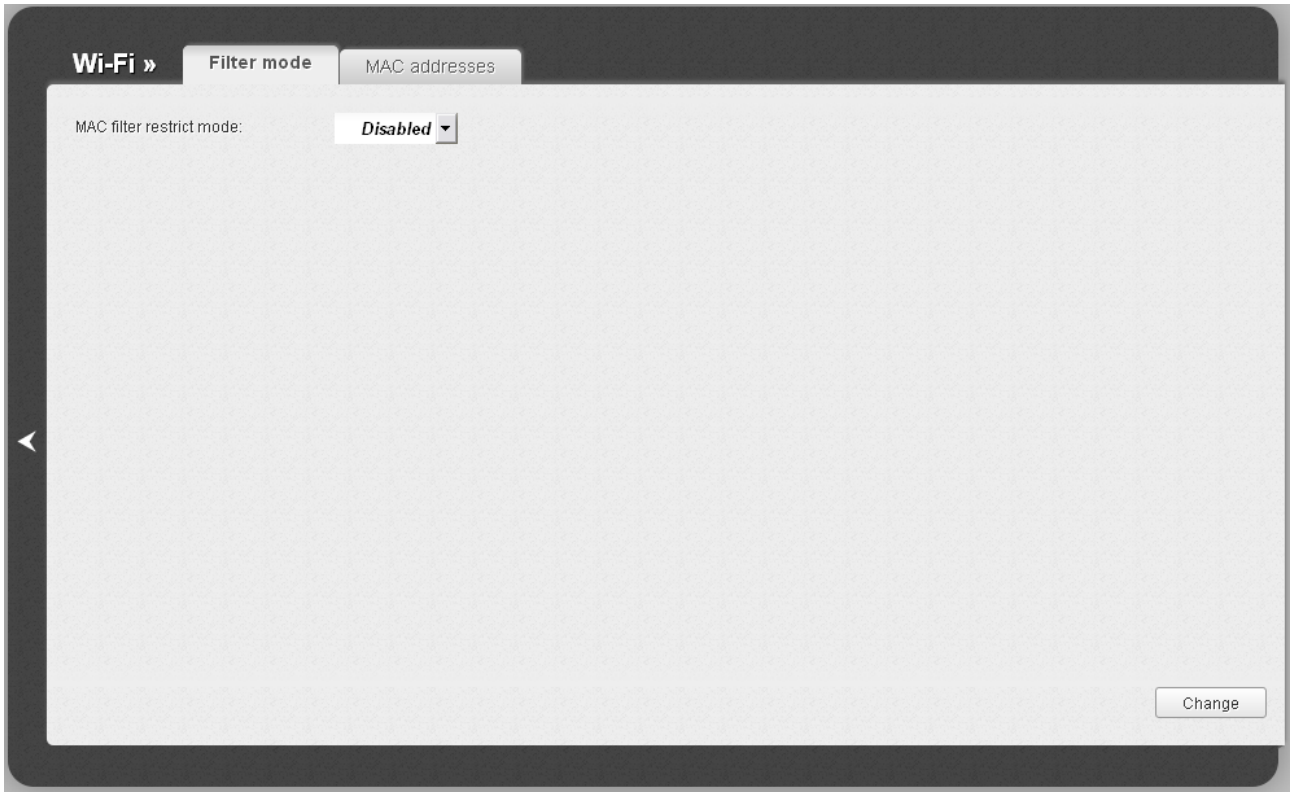

Figure 94. The MAC filter for the wireless network.

By default, MAC filtering is not active (the **Disabled** value is selected from the **MAC filter restrict mode** drop-down list on the **Filter mode** tab).

To open your wireless network for the devices which MAC addresses are specified on the **MAC addresses** tab and to close the wireless network for all other devices, select the **Allow** value from the **MAC filter restrict mode** drop-down list and click the **Change** button.

To close your wireless network for the devices which MAC addresses are specified on the **MAC addresses** tab, select the **Deny** value from the **MAC filter restrict mode** drop-down list and click the **Change** button.

To add a MAC address to which the selected filtering mode will be applied, proceed to the **MAC addresses** tab.

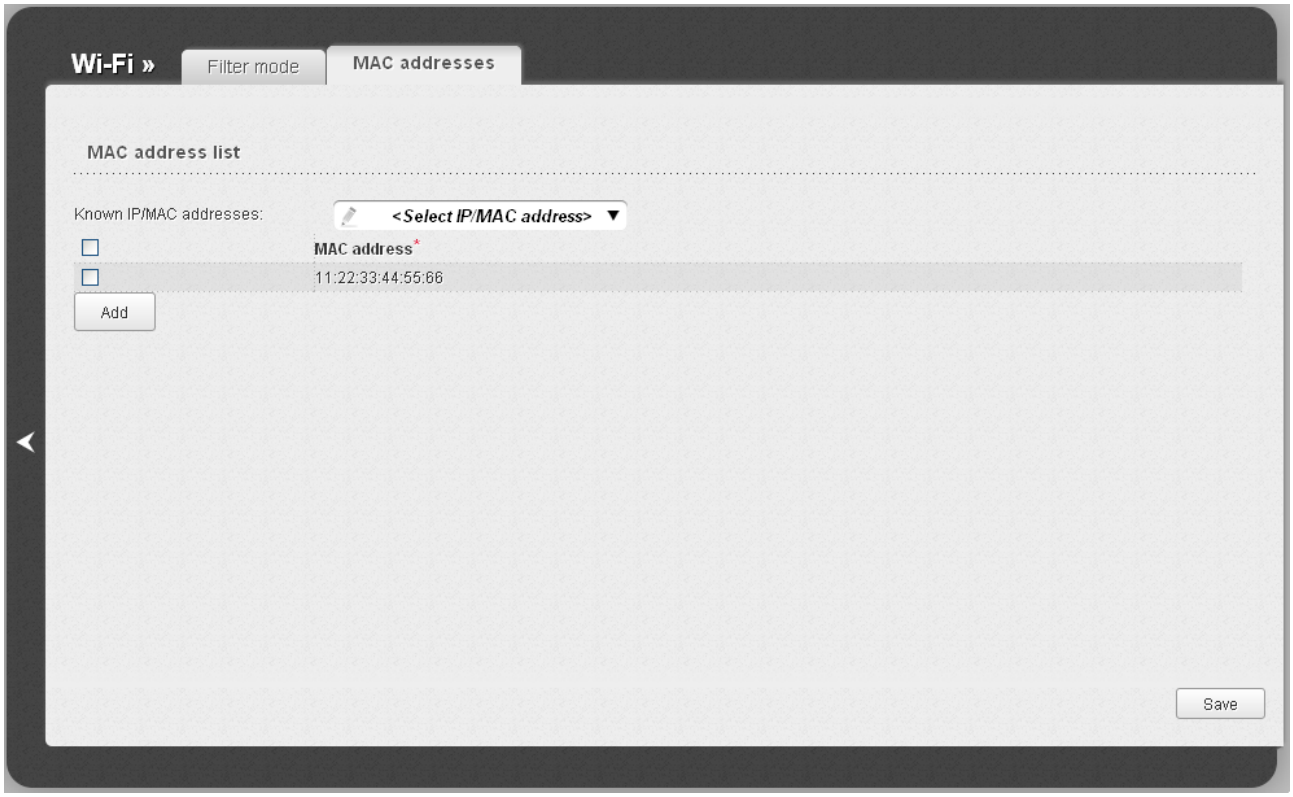

Figure 95. The tab for adding a MAC address.

Click the **Add** button and enter an address in the field displayed. Also you can enter the MAC address of a device connected to the router's LAN at the moment. To do this, select the relevant device from the **Known IP/MAC addresses** drop-down list (the field will be filled in automatically). Then click the **Save** button.

To remove a MAC address from the list of MAC addresses, select the checkbox located to the left of the relevant MAC address and click the **Save** button.

Station List

On the **Wi-Fi / Station List** page, you can view the list of wireless clients connected to the router.

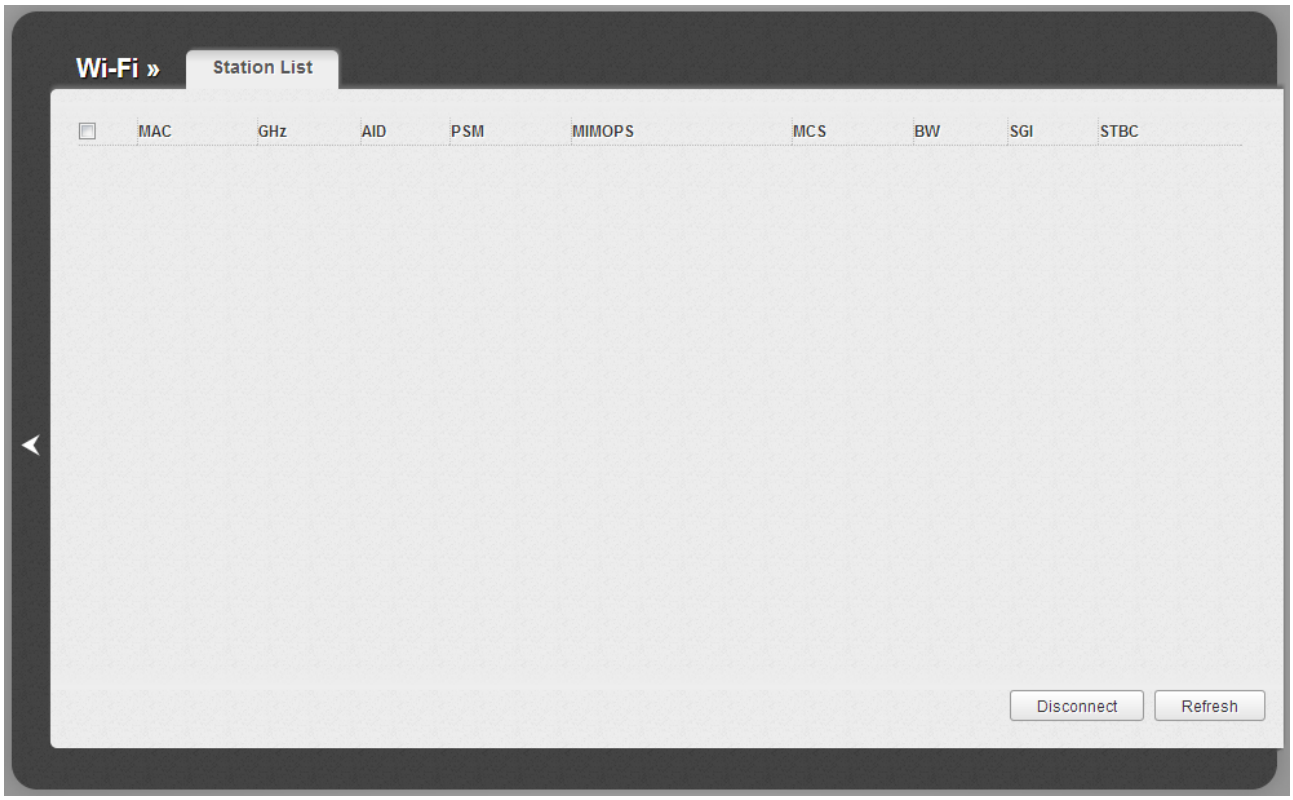

Figure 96. The list of the wireless clients.

If you want to disconnect a wireless device from your WLAN, select the checkbox in the line containing the relevant MAC address, and click the **Disconnect** button.

To view the latest data on the devices connected to the WLAN, click the **Refresh** button.

WPS

On the **Wi-Fi / WPS** page, you can enable the function for secure configuration of the WLAN and select a method used to easily add wireless devices to the WLAN.

The WPS function helps to configure the protected wireless network automatically. Devices connecting to the wireless network via the WPS function must support the WPS function.

> **!** Before using the function you need to configure one of the following authentication types: **Open** with no encryption, **WPA2-PSK**, or **WPA-PSK/WPA2-PSK mixed** with the **AES** encryption method (on the relevant band tab of the **Wi-Fi / Security settings** page). When other security settings are specified for the band of the WLAN, controls of the tab on the **Wi-Fi / WPS** page are not available.

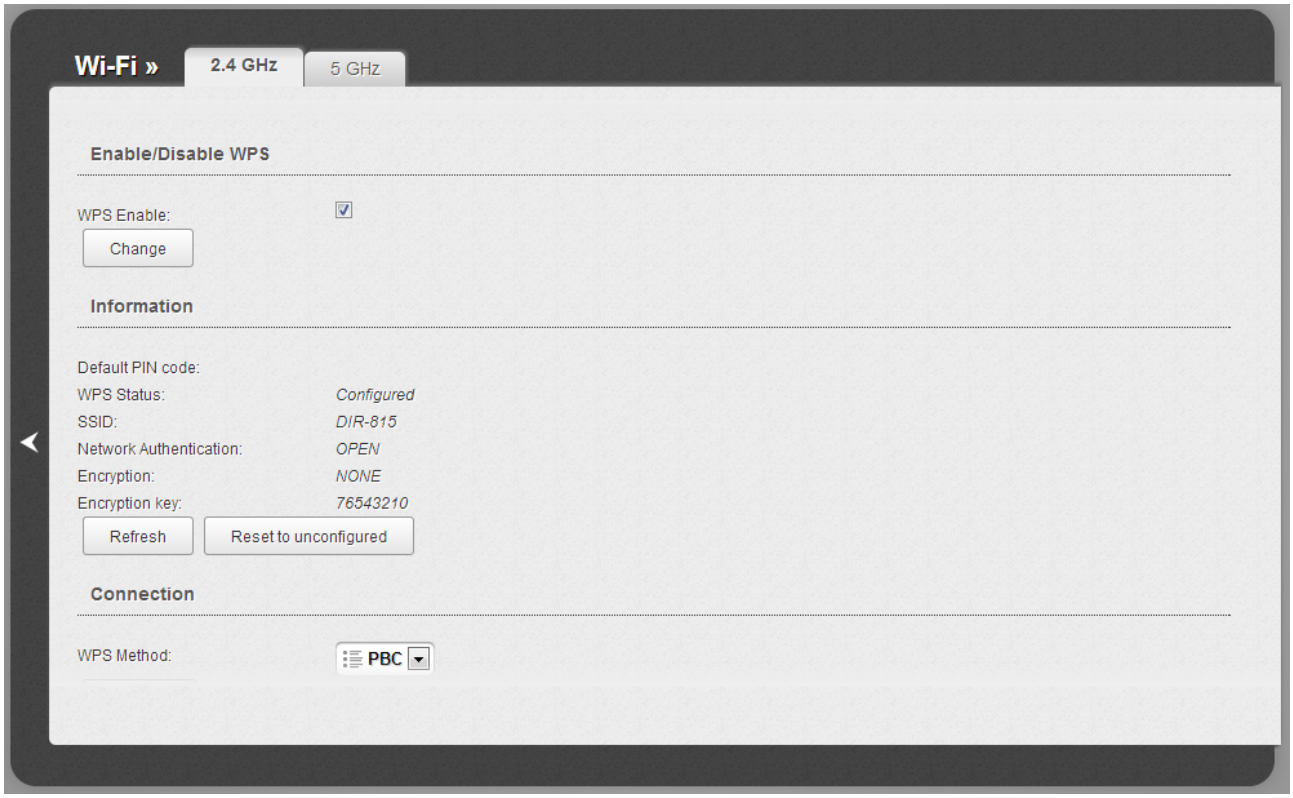

Figure 97. The page for configuring the WPS function.

To activate the WPS function, select the **WPS Enable** checkbox on the **2.4 GHz** or **5 GHz** tab and click the **Change** button. When the checkbox is selected, the **Information** and **Connection** sections are available on the tab.

Parameter	Description
Default PIN code	The PIN code of the router. This parameter is used when connecting the router to a registrar to set the parameters of the WPS function.
WPS Status	The state of the WPS function: • **Configured** (all needed settings are specified; these settings will be used upon establishing the wireless connection) • **Unconfigured** (after activating the WPS function, needed settings will be configured automatically: the MAC address of the wireless interface will be added to the SSID, the network authentication type will be changed to WPA2-PSK with a random encryption key).
SSID	The name of the router's WLAN.
Network Authentication	The network authentication type specified for the WLAN.
Encryption	The encryption type specified for the WLAN.
Encryption key	The encryption key specified for the WLAN.
Refresh	Click the button to refresh the data on the page.
Reset to unconfigured	Click the button to generate new settings for the router's WLAN automatically after activating the WPS function.
WPS Method	A method of the WPS function. Select a value from the drop-down list. **PIN**: Connecting the device via the PIN code. **PBC**: Connecting the device via the push button (actual or virtual).
PIN Code	The PIN code of the WPS-enabled device that needs to be connected to the wireless network of the router. The field is displayed only when the **PIN** value is selected from the **WPS Method** drop-down list.
Connect	Click the button to connect the wireless device to the router's WLAN via the WPS function.

Using WPS Function via Web-based Interface

To add a wireless device via the PIN method of the WPS function, follow the next steps:

1. Select the **WPS Enable** checkbox.
2. Click the **Change** button.
3. Select the **PIN** value from the **WPS Method** drop-down list.
4. Select the PIN method in the software of the wireless device that you want to connect to the router's WLAN.
5. Click the relevant button in the software of the wireless device that you want to connect to the WLAN.
6. Right after that, enter the PIN code specified on the cover of the wireless device or in its software in the **PIN Code** field.
7. Click the **Connect** button in the web-based interface of the router.

To add a wireless device via the PBC method of the WPS function, follow the next steps:

1. Select the **WPS Enable** checkbox.
2. Click the **Change** button.
3. Select the **PBC** value from the **WPS Method** drop-down list.
4. Select the PBC method in the software of the wireless device that you want to connect to the router's WLAN.
5. Click the relevant button in the software or press the WPS button on the cover of the wireless device that you want to connect to the WLAN.
6. Click the **Connect** button in the web-based interface of the router.

Using WPS Function without Web-based Interface

You can add a wireless device to the router's WLAN without accessing the web-based interface of the router. To do this, you need to configure the following router's settings:

1. Specify corresponding security settings for the wireless network of the router.
2. Select the **WPS Enable** checkbox.
3. Click the **Change** button.
4. Save the settings and close the web-based interface (click the **Save** line in the top-page menu displayed when the mouse pointer is over the **System** caption, then click the **Logout** line).

Later you will be able to add wireless devices to the WLAN by pressing the **WPS** button of the router.

1. Select the PBC method in the software of the wireless device that you want to connect to the router's WLAN.
2. Click the relevant button in the software or press the WPS button on the cover of the wireless device that you want to connect to the WLAN.
3. Press the **WPS** button of the router, hold it for 2 seconds, and release when the **WPS** LED starts blinking.

Additional Settings

On the **Wi-Fi / Additional settings** page, you can define additional parameters for the WLAN of the router. To configure the 2.4GHz band or 5GHz band, proceed to the relevant tab.

Changing parameters presented on this page may negatively affect your WLAN!

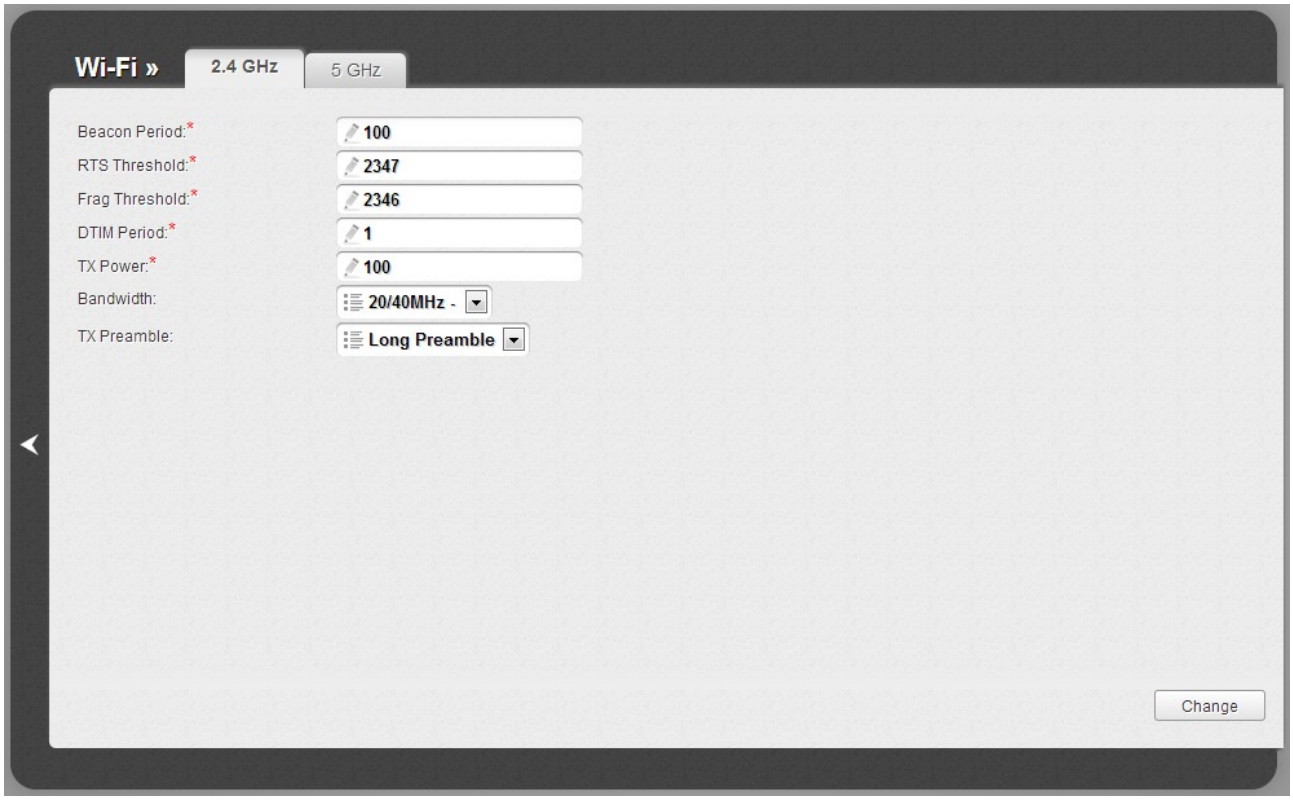

Figure 98. Additional settings of the WLAN.

The following fields are available on the page:

Parameter	Description
Beacon Period	The time interval (in milliseconds) between packets sent to synchronize the wireless network.
RTS Threshold	The minimum size (in bites) of a packet for which an RTS frame is transmitted.
Frag Threshold	The maximum size (in bites) of a non-fragmented packet. Larger packets are fragmented (divided).
DTIM Period	The time period (in seconds) between sending a DTIM (a message notifying on broadcast or multicast transmission) and data transmission.
TX Power	The transmit power (in percentage terms) of the router.

Parameter	Description
Bandwidth	The channel bandwidth for 802.11n devices in 2.4GHz band. **20MHz**: 802.11n devices operate at 20MHz channels. **40MHz**: 802.11n devices operate at 40MHz channels. **20/40MHz -**: 802.11n devices operate at 20MHz and 40MHz channels (the channel is combined with the previous adjacent channel). **20/40MHz +**: 802.11n devices operate at 20MHz and 40MHz channels (the channel is combined with the next adjacent channel).
TX Preamble	This parameter defines the length of the CRC block sent by the router when communicating to wireless devices. Select a value from the drop-down list. **Long Preamble**. **Short Preamble** (this value is recommended for networks with high-volume traffic).

When you have configured the parameters, click the **Change** button.

WMM

On the **Wi-Fi / WMM** page, you can enable the Wi-Fi Multimedia function.

The WMM function implements the QoS features for Wi-Fi networks. It helps to improve the quality of data transfer over Wi-Fi networks by prioritizing different types of traffic.

To enable the function, select the **WMM** checkbox and click the **Save** button.

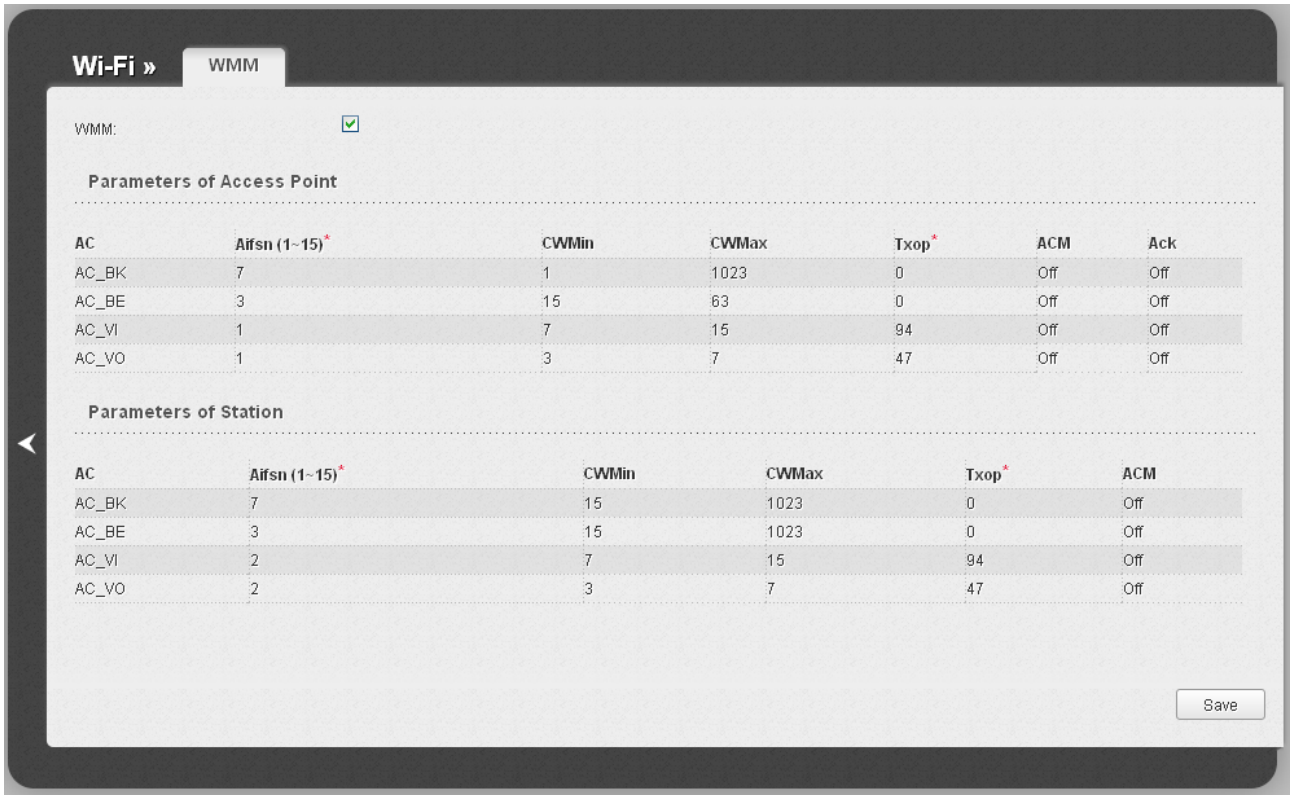
Wi-Fi »
WMM
WMM:
Parameters of Access Point
AC | Aifsn (1~15)* | CWMin | CWMax | Txop* | ACM | Ack
AC_BK | 7 | 1 | 1023 | 0 | Off | Off
AC_BE | 3 | 15 | 63 | 0 | Off | Off
AC_VI | 1 | 7 | 15 | 94 | Off | Off
AC_VO | 1 | 3 | 7 | 47 | Off | Off
Parameters of Station
AC | Aifsn (1~15)* | CWMin | CWMax | Txop* | ACM
AC_BK | 7 | 15 | 1023 | 0 | Off
AC_BE | 3 | 15 | 1023 | 0 | Off
AC_VI | 2 | 7 | 15 | 94 | Off
AC_VO | 2 | 3 | 7 | 47 | Off
Save

Figure 99. The page for configuring the WMM function.

! All needed settings for the WMM function are specified in the device's system. It is recommended not to change the default values.

The WMM function allows assigning priorities for four Access Categories (AC):

- **AC_BK** (*Background*), low priority traffic (print jobs, file downloads, etc.).
- **AC_BE** (*Best Effort*), traffic from legacy devices or devices/applications that do not support QoS.
- **AC_VI** (*Video*).
- **AC_VO** (*Voice*).

Parameters of the Access Categories are defined for both the router itself (in the **Parameters of Access Point** section) and wireless devices connected to it (in the **Parameters of Station** section).

For every Access Category the following fields are available:

Parameter	Description
Aifsn	*Arbitrary Inter-Frame Space Number*. This parameter influences time delays for the relevant Access Category. The lower the value, the higher is the Access Category priority.
CWMin/CWMax	*Contention Window Minimum/Contention Window Maximum*. Both fields influence time delays for the relevant Access Category. The **CWMax** field value should not be lower, than the **CWMin** field value. The lower the difference between the **CWMax** field value and the **CWMin** field value, the higher is the Access Category priority.
Txop	*Transmission Opportunity*. The higher the value, the higher is the Access Category priority.
ACM	*Admission Control Mandatory*. If selected, prevents from using the relevant Access Category.
Ack	*Acknowledgment*. Answering response requests while transmitting. Displayed only in the **Parameters of Access Point** section. If not selected, the router answers requests. If selected, the router does not answer requests.

When you have configured the parameters, click the **Save** button.

Client

On the **Wi-Fi / Client** page, you can configure the router as a client to connect to a wireless access point.

As a rule, the client mode is used to connect to a WISP network. All parameters specified on this page should be provided by your WISP.

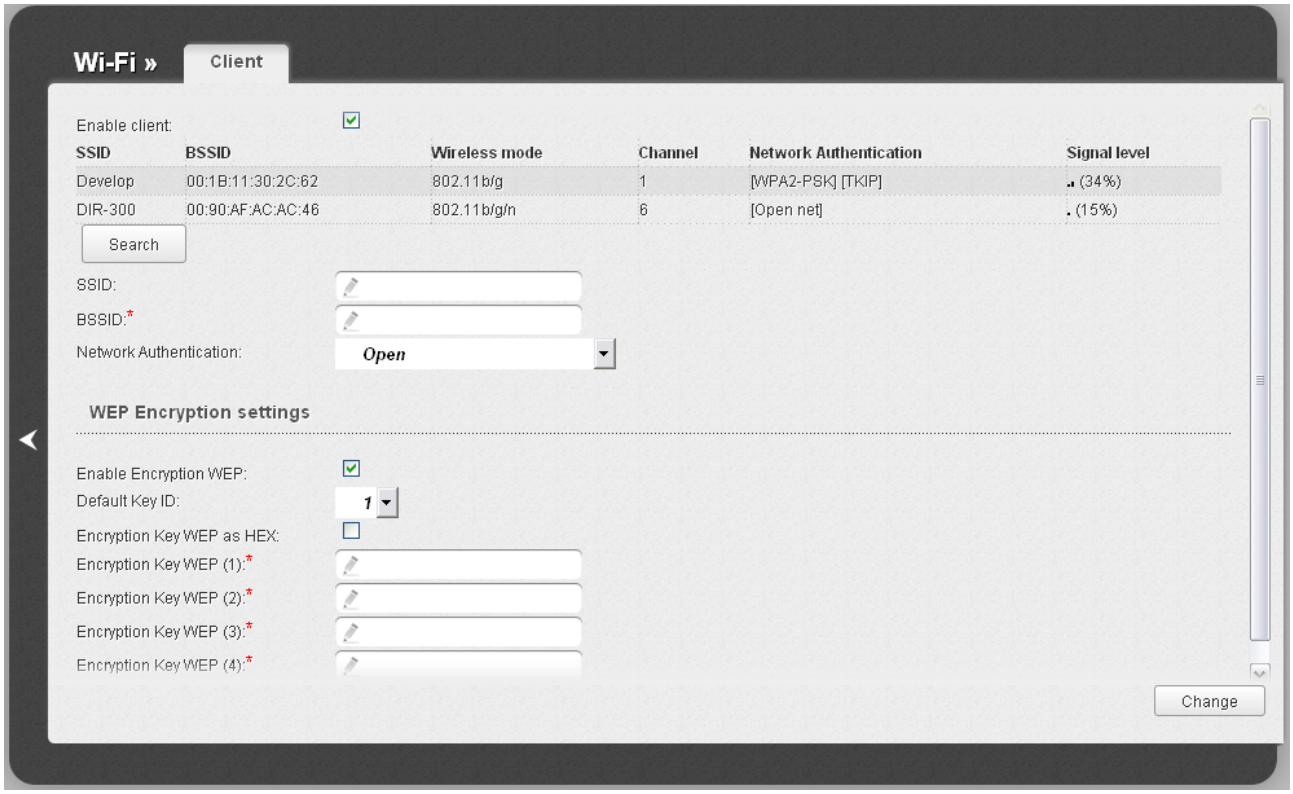

Figure 100. The page for configuring the client mode.

To configure the router as a client, select the **Enable client** checkbox. When the checkbox is selected, the following fields are displayed on the page:

Parameter	Description
SSID	The name of the network to which the router connects.
BSSID	The unique identifier of the network to which the router connects.
Network Authentication	The authentication type of the network to which the router connects.

When the **Open** or **Shared** authentication type is selected, the following fields are available:

Parameter	Description
Enable Encryption WEP	The checkbox activating WEP encryption. When the checkbox is selected, the **Default Key ID** field, the **Encryption Key WEP as HEX** checkbox, and four **Encryption Key WEP** fields are displayed on the page. For the **Shared** authentication type the checkbox is always selected.
Default Key ID	The number of the key (from first to fourth) which will be used for WEP encryption.
Encryption Key WEP as HEX	Select the checkbox to set a hexadecimal number as a key for encryption.
Encryption Key WEP (1-4)	Keys for WEP encryption. The router uses the key selected from the **Default Key ID** drop-down list. It is required to specify all the fields. You can specify keys containing 5 or 13 symbols (use digits and/or Latin characters). If the **Encryption Key WEP as HEX** checkbox is selected, you can specify only keys containing 10 symbols (the digits 0-9 and the characters A-F).

When the **WPA-PSK**, **WPA2-PSK**, or **WPA-PSK/WPA2-PSK mixed** authentication type is selected, the following fields are available:

Parameter	Description
Encryption Key PSK	A key for WPA encryption. The key can contain digits and/or Latin characters.
WPA Encryption	An encryption method: **TKIP**, **AES**, or **TKIP+AES**.

When you have configured the parameters, click the **Change** button.

In addition, when the **Enable client** checkbox is selected, the list of available wireless networks is displayed on the page.

To view the latest data on the available wireless networks, click the **Search** button.

To connect to a wireless network from the list, select the needed network. Upon that the relevant values are automatically inserted in the **SSID**, **BSSID**, and **Network Authentication** fields.

For the **Open** authentication type with no encryption, click the **Change** button.

For the **Open** authentication type with encryption and the **Shared** authentication type, select a needed value from the **Default Key ID** drop-down list. If needed, select the **Encryption Key WEP as HEX** checkbox to set a hexadecimal number as a key for encryption. Then fill in 4 **Encryption Key WEP** fields and click the **Change** button.

For the **WPA-PSK**, **WPA2-PSK**, or **WPA-PSK/WPA2-PSK mixed** authentication types, fill in the **Encryption Key PSK** field and click the **Change** button.

After clicking the **Change** button, the wireless channel of DIR-815 will switch to the channel of the wireless access point to which you have connected.

If the router is connected to the selected network successfully, the green indicator appears to the right of the network's SSID in the table.

After configuring the device as a client, you need to create a WAN connection with relevant parameters for the **WiFiClient** port.

Advanced

In this menu you can configure advanced settings of the router:

- create groups of ports for VLANs
- enable the UPnP function
- configure a DDNS service
- add name servers
- define static routes
- create rules for remote access to the web-based interface
- allow the router to use IGMP
- configure TR-069 client
- enable the flow control function.

VLAN

On the **Advanced / VLAN** page, you can create and edit groups of ports for virtual networks (VLANs).

By default, 2 groups are created in the router's system:

- **lan**: it includes ports 1-4 and the wireless interface;
- **wan**: for the WAN interface; it includes the INTERNET port.

The **VLAN ID** parameter is not specified for both groups. Such a setting means that these groups of ports are not assigned to any VLAN.

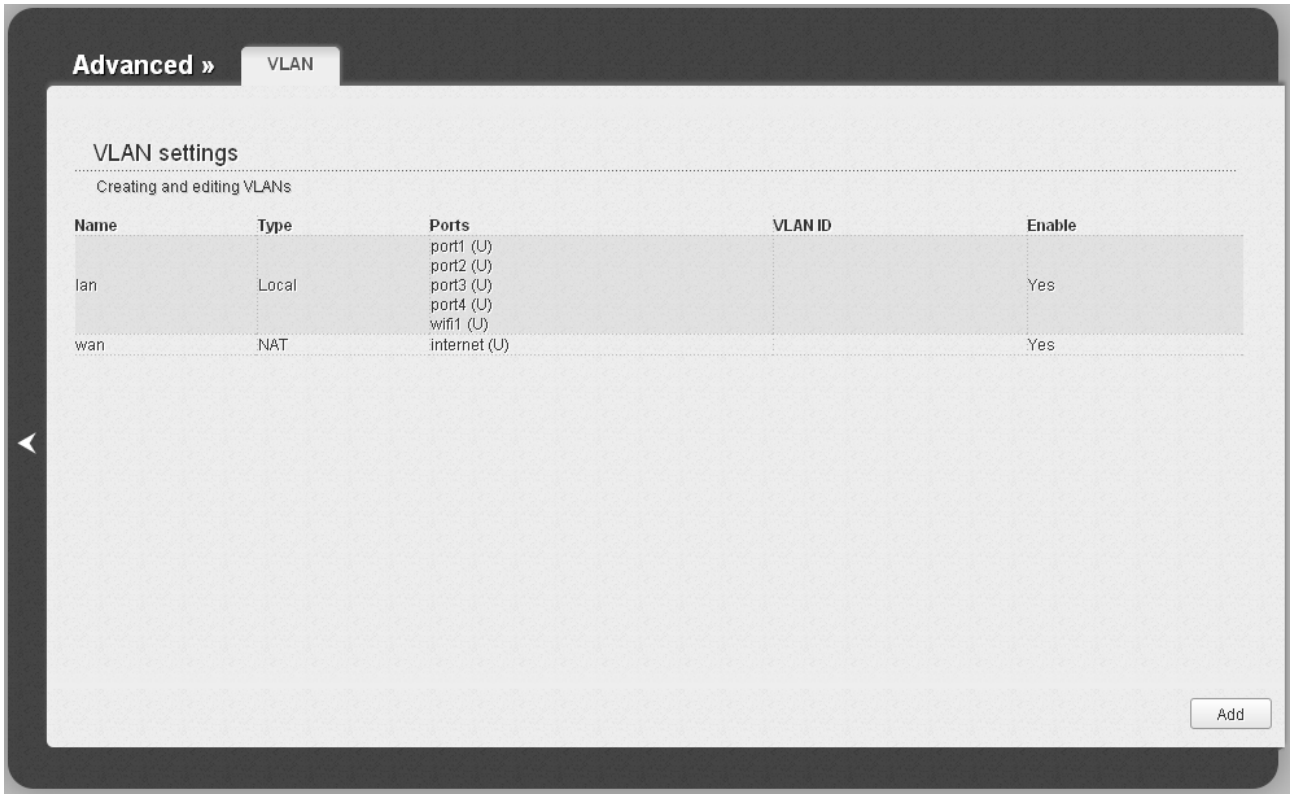

*Figure 101. The **Advanced / VLAN** page.*

To create a new group for VLAN, click the **Add** button.

! If you want to create a group including LAN ports or the wireless network of the router, first delete relevant records from the **lan** group on this page.

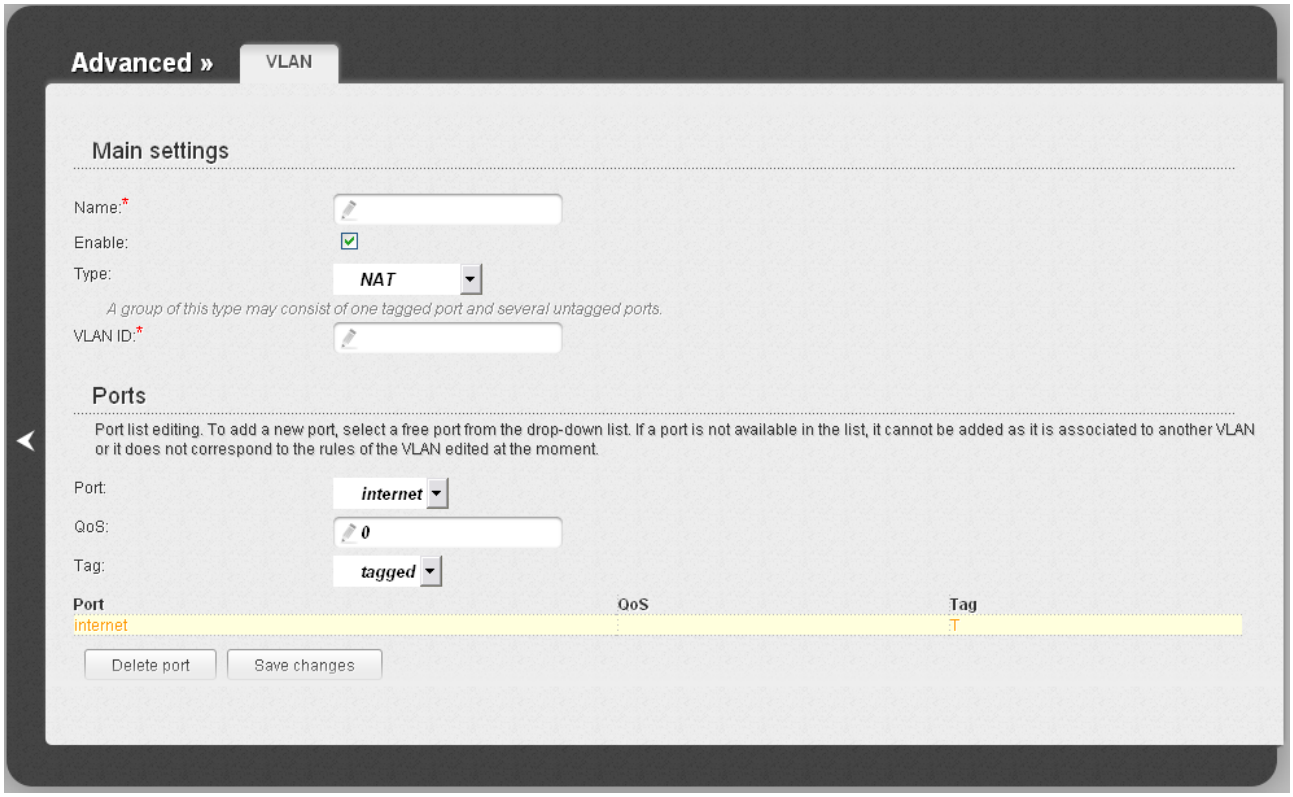

Figure 102. The page for editing a group of ports for VLAN.

You can specify the following parameters:

Parameter	Description
Main settings	
Name	A name for the port for easier identification.
Enable	Select the checkbox to allow using this group of ports.
Type	The type of the VLAN which identifier is specified in the **VLAN ID** field. **Local**. The group of this type is a channel used to connect local clients to the router. It is mostly used to connect different types of clients, which require separate connection settings. **NAT**. The group of this type is an external connection with address translation. It is mostly used to connect to the Internet. Later the VLAN which identifier is specified in the **VLAN ID** field is used to create a WAN connection (on the **Net / WAN** page). **Transparent**. The group of this type is a transparent connection between an internal port and an external connection. It is mostly used to connect IPTV set-top boxes.
VLAN ID	An identifier of the VLAN to which this group of ports will be assigned.

Parameter	Description
Ports	
Port	From the list, select an available value (a physical port of the router, the wireless interface) to assign it to this group. The port will be displayed in the table at the bottom of the page.
QoS	A priority tag for the traffic transmitted through the port highlighted in the table at the bottom of the page.
Tag	Select a value for the port highlighted in the table at the bottom of the page: • **tagged**, • **untagged**.

Click the **Save changes** button.

Click the **Delete port** button to delete the port highlighted in the table at the bottom of the page.

Click the **Delete VLAN** button to delete this group of ports form the system.

! For further use of groups of ports for VLAN it is required to save the changed settings to the non-volatile memory of the router and reboot it (click the **Save&Reboot** line in the top-page menu displayed when the mouse pointer is over the **System** caption).

UPnP

On the **Advanced / UPnP** page, you can enable and disable the UPnP function.

UPnP is a set of networking protocols designed for automatic configuration of network devices. The UPnP function performs automatic configuration of the device's parameters for network applications requiring an incoming connection to the router.

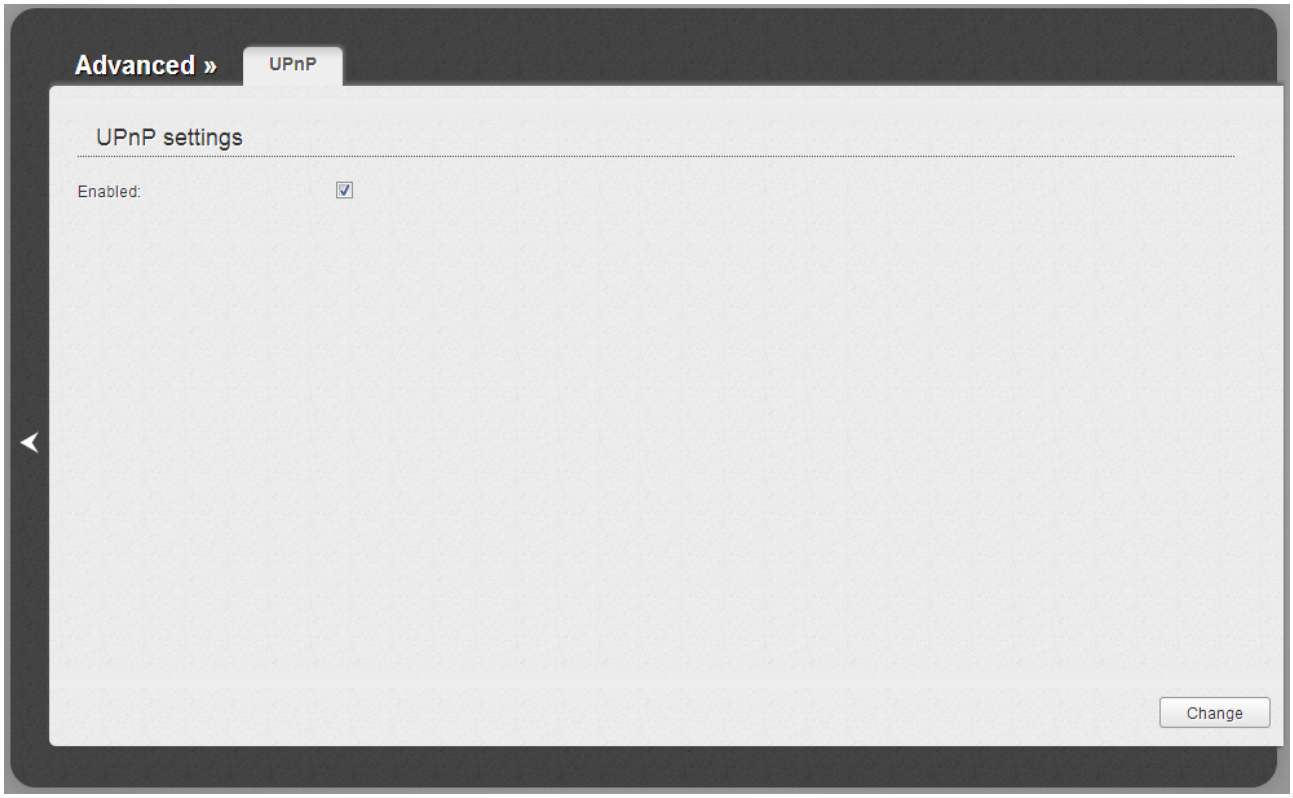

*Figure 103. The **Advanced / UPnP** page.*

If you want to manually specify all parameters needed for network applications, deselect the **Enabled** checkbox and click the **Change** button.

If you want to enable the UPnP function in the router, select the **Enabled** checkbox and click the **Change** button.

DDNS

On the **Advanced / DDNS** page, you can define parameters of the DDNS service, which allows associating a domain name with dynamic IP addresses.

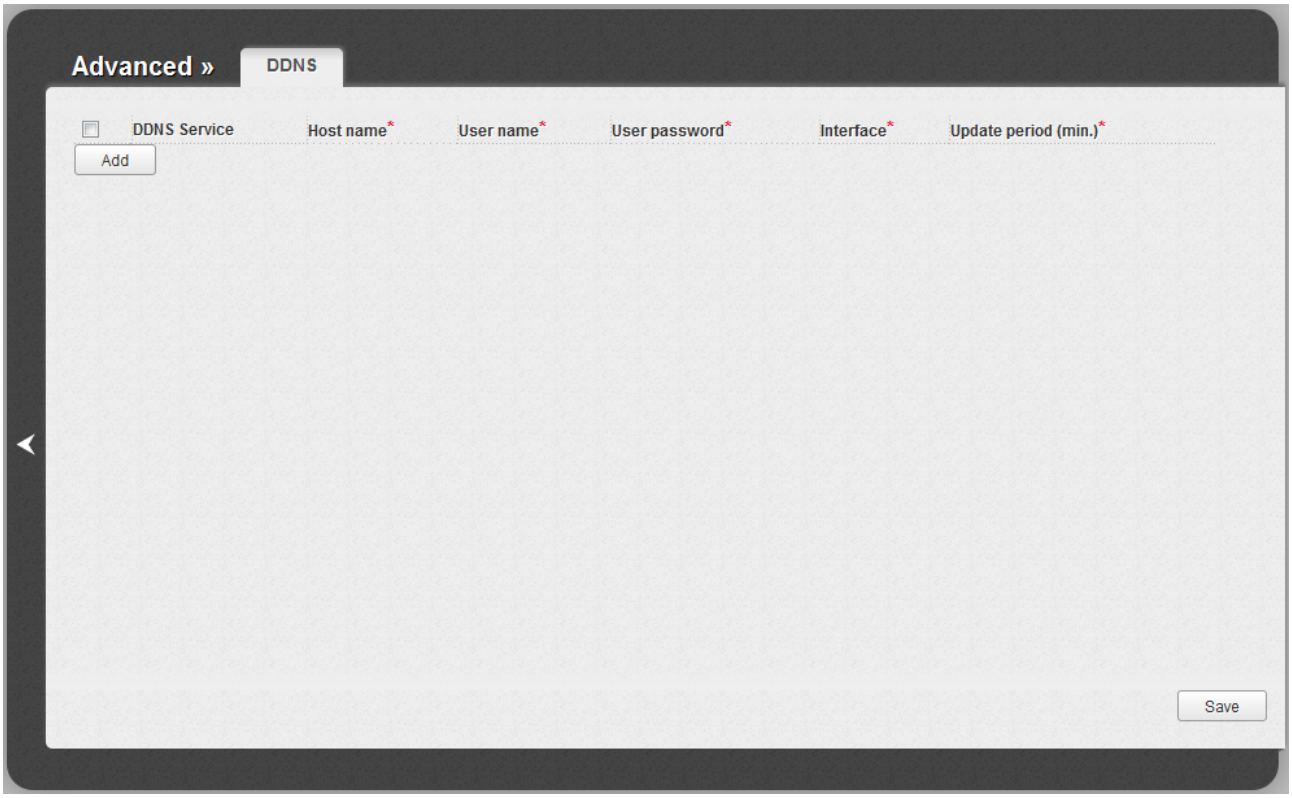

*Figure 104. The **Advanced / DDNS** page.*

To add a new DDNS service, click the **Add** button. In the line displayed, you can specify the following parameters:

Parameter	Description
DDNS Service	Select a DDNS provider from the drop-down list.
Host name	The domain name registered at your DDNS provider.
User name	The username to authorize for your DDNS provider.
User password	The password to authorize for your DDNS provider.
Interface	Select a WAN connection which IP address will be used to access the DDNS service.
Update period	An interval (in minutes) between sending data with the IP address of the interface specified in the field above to the relevant DDNS service.

After specifying the needed parameters, click the **Save** button.

To edit parameters of the existing DDNS service, select a needed field in the relevant line of the table, change its value, and click the **Save** button.

To remove an existing DDNS service, select the checkbox located to the left of the relevant line in the table and click the **Save** button.

DNS

On the **Advanced / DNS** page, you can add DNS servers to the system.

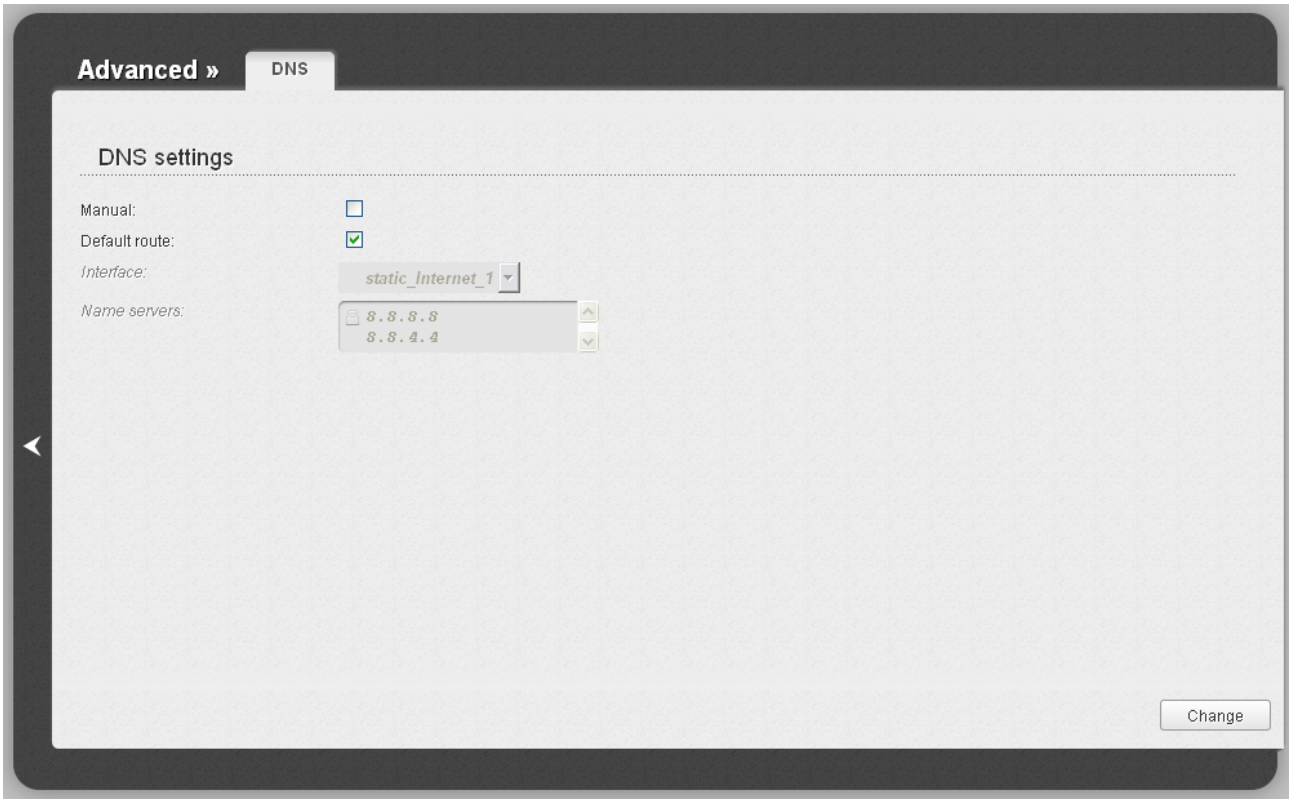

*Figure 105. The **Advanced / DNS** page.*

DNS servers are used to determine the IP address from the name of a server in Intranets or the Internet (as a rule, they are specified by an ISP or assigned by a network administrator).

The device performs the DNS relay function, i.e., it redirects the DNS requests of users to external DNS servers. You can specify the addresses of DNS servers manually on this page, or configure the router to obtain DNS servers addresses automatically from your ISP upon installing a connection.

> **!** When you use the built-in DHCP server, the network parameters (including DNS servers) are distributed to clients automatically.

If you want to configure automatic obtainment of DNS servers addresses, deselect the **Manual** checkbox, select a WAN connection which will be used to obtain addresses of DNS servers automatically from the **Interface** drop-down list or select the **Default route** checkbox, so that the router could use the connection set as the default gateway (on the **Net / WAN** page) to obtain DNS server addresses, and click the **Change** button.

If you want to specify the DNS server manually, select the **Manual** checkbox and enter a DNS server address in the **Name servers** list. To specify several addresses, press the **Enter** key and enter a needed address in the next line. Then click the **Change** button.

To remove a DNS server from the system, remove the relevant line from the **Name servers** field and click the **Change** button.

Routing

On the **Advanced / Routing** page, you can add static routes (routes for networks that are not connected directly to the device but are available through the interfaces of the device) into the system.

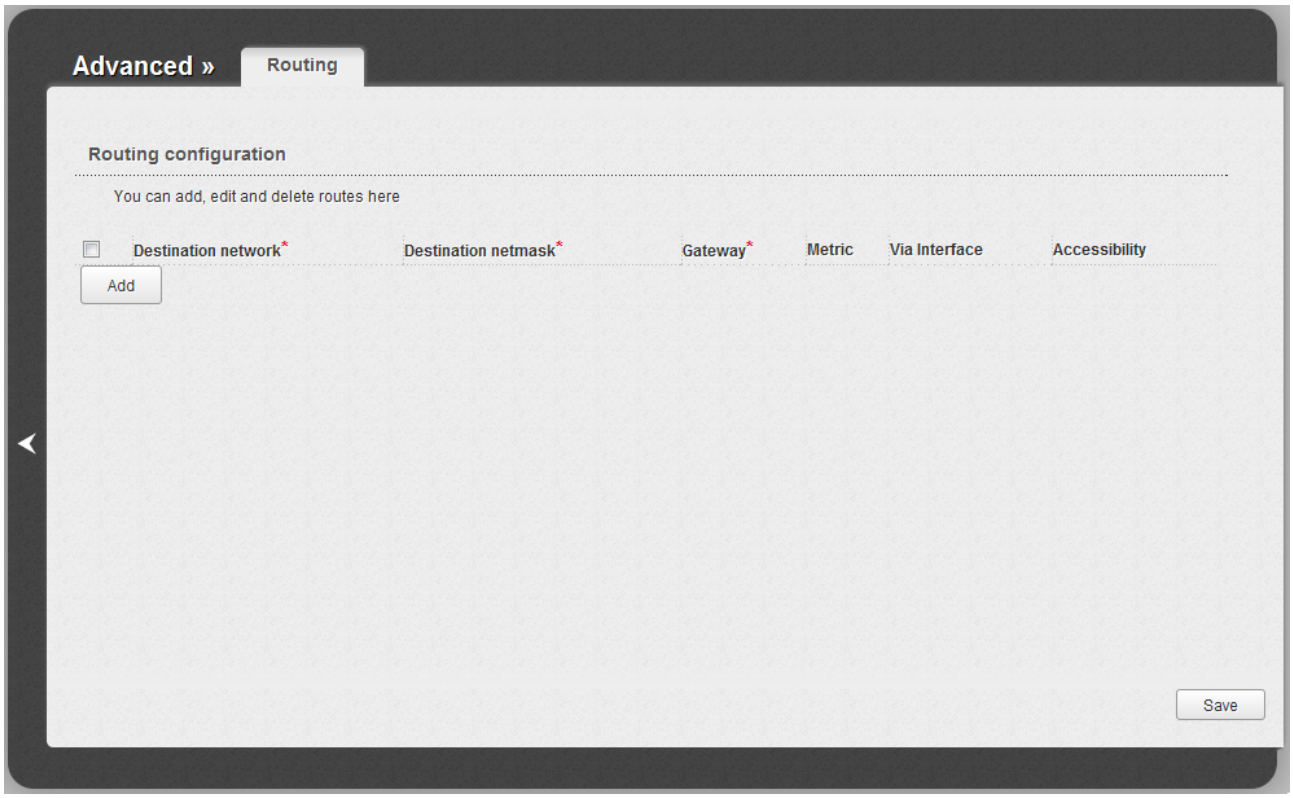

*Figure 106. The **Advanced / Routing** page.*

To create a new route, click the **Add** button. In the line displayed, you can specify the following parameters:

Parameter	Description
Destination network	A destination network to which this route is assigned.
Destination netmask	The destination network mask.
Gateway	An IP address through which the destination network can be accessed. The field is available when the **<Auto>** value is selected from the **Via Interface** drop-down list of this line.
Metric	A metric for the route. The lower the value, the higher is the route priority. *Optional*.
Via Interface	Select an interface through which the destination network can be accessed from the drop-down list. If you have selected the **<Auto>** value of this drop-down list, the router itself sets the interface on the basis of data on connected networks.

After specifying the needed parameters, click the **Save** button.

To edit an existing route, select a needed field in the relevant line of the table, change its value, and click the **Save** button.

To remove an existing route, select the checkbox located to the left of the relevant line in the table and click the **Save** button.

Remote Access

On the **Advanced / Remote access** page, you can configure access to the web-based interface of the router. By default, the access from external networks to the router is closed. If you need to allow access to the router from the external network, create relevant rules.

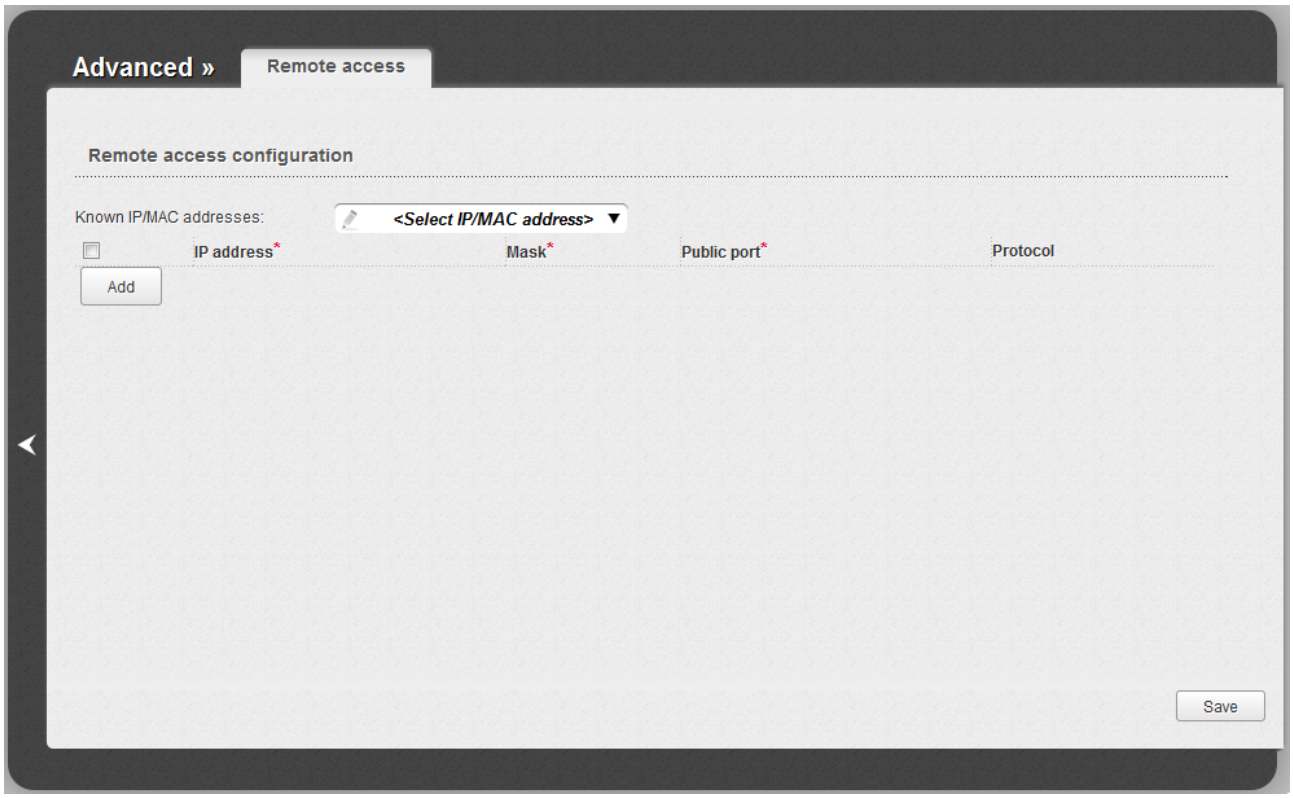

*Figure 107. The **Advanced / Remote access** page.*

To create a new rule, click the **Add** button. In the line displayed, you can specify the following parameters:

Parameter	Description
IP address	A host or a subnet to which the rule is applied.
Mask	The mask of the subnet.
Public port	An external port of the router. You can specify only one port.
Protocol	The protocol available for remote management of the router.

After specifying the needed parameters, click the **Save** button.

To edit a rule for remote access, select a needed field in the relevant line of the table, change its value, and click the **Save** button.

To remove a rule for remote access, select the checkbox located to the left of the relevant line in the table and click the **Save** button.

IGMP

On the **Advanced / IGMP** page, you can enable IGMP for the router.

IGMP is used for managing multicast traffic (transferring data to a group of destinations). This protocol allows using network resources for some applications, e.g., for streaming video, more efficiently.

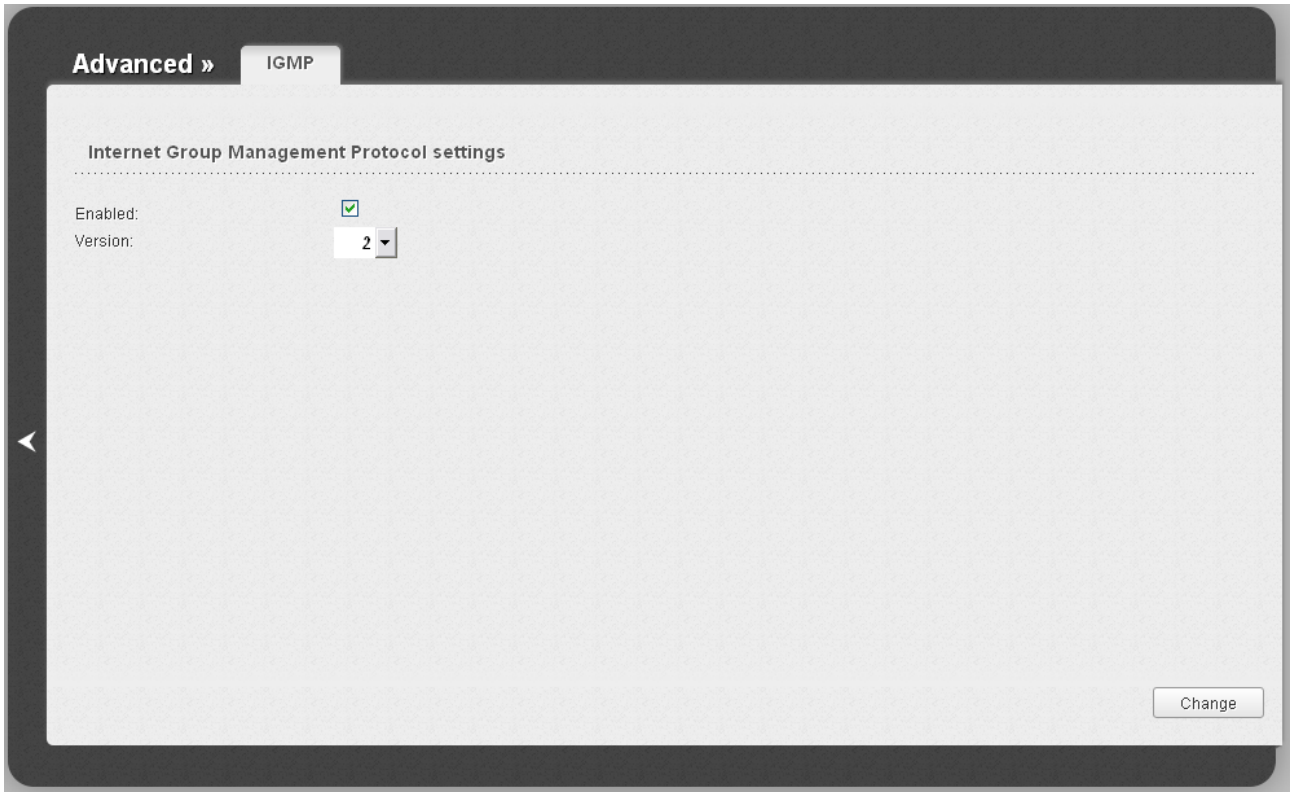

*Figure 108. The **Advanced / IGMP** page.*

To enable IGMP, select the **Enabled** checkbox. From the **Version** drop-down list, select a version of IGMP. Then click the **Change** button. Such a setting allows using the IGMP Proxy function for all WAN connections for which the **Enable IGMP Multicast** checkbox is selected.

To disable IGMP, deselect the **Enabled** checkbox and click the **Change** button.

TR-069 Client

On the **Advanced / TR-069 Client** page, you can configure the router for communication with a remote Auto Configuration Server (ACS).

The TR-069 client is used for remote monitoring and management of the device.

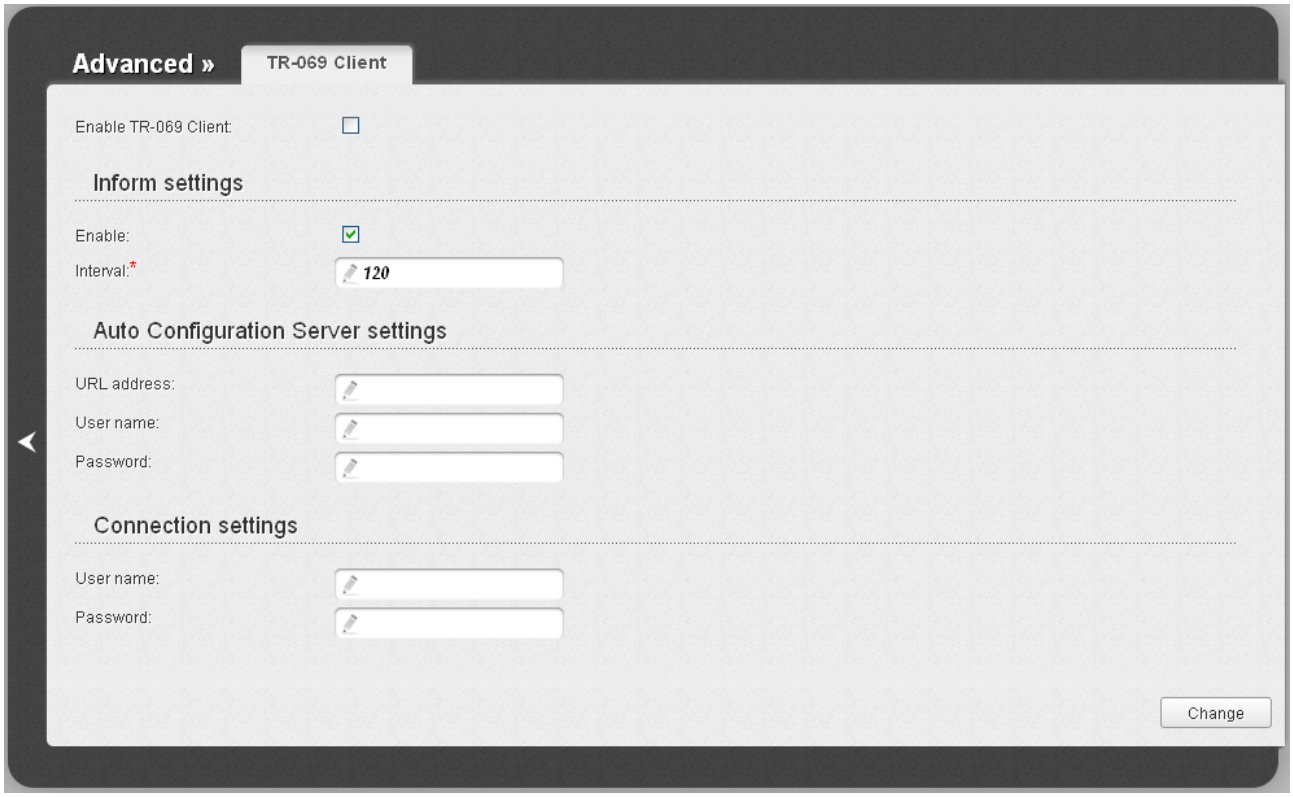

Figure 109. The page for configuring the TR-069 client.

You can specify the following parameters:

Parameter	Description
Enable TR-069 Client	Select the checkbox to enable the TR-069 client.
Inform settings	
Enable	Select the checkbox so the router may send reports (data on the device and network statistics) to the ACS.
Interval	Specify the time period (in seconds) between sending reports.
Auto Configuration Server settings	
URL address	The URL address of the ACS provided by the ISP.
User name	The username to connect to the ACS. The username can contain digits, Latin letters (uppercase and/or lowercase), and characters available on the keyboard.

Parameter	Description
Password	The password to connect to the ACS. The password can contain digits, Latin letters (uppercase and/or lowercase), and characters available on the keyboard.
Connection settings	
User name	The username which the ACS uses to connect to the router. The username can contain digits, Latin letters (uppercase and/or lowercase), and characters available on the keyboard.
Password	The password which the ACS uses to connect to the router. The password can contain digits, Latin letters (uppercase and/or lowercase), and characters available on the keyboard.

When you have configured the parameters, click the **Change** button.

Flow Control

On the **Advanced / Flow Control** page, you can enable and disable data flow control for the WAN port of the router.

This function is used for equal load balancing in ISPs' networks. Contact your ISP to clarify if this function needs to be enabled.

*Figure 110. The **Advanced / Flow Control** page.*

To enable the flow control function, select the **Enabled** checkbox and click the **Change** button.

To disable the flow control function, deselect the **Enabled** checkbox and click the **Change** button.

Firewall

In this menu you can configure the firewall of the router:

- add rules for IP filtering
- create virtual servers
- define a DMZ
- configure the MAC filter.

IP Filters

On the **Firewall / IP filters** page, you can create new rules for filtering IP packets and edit or remove existing rules.

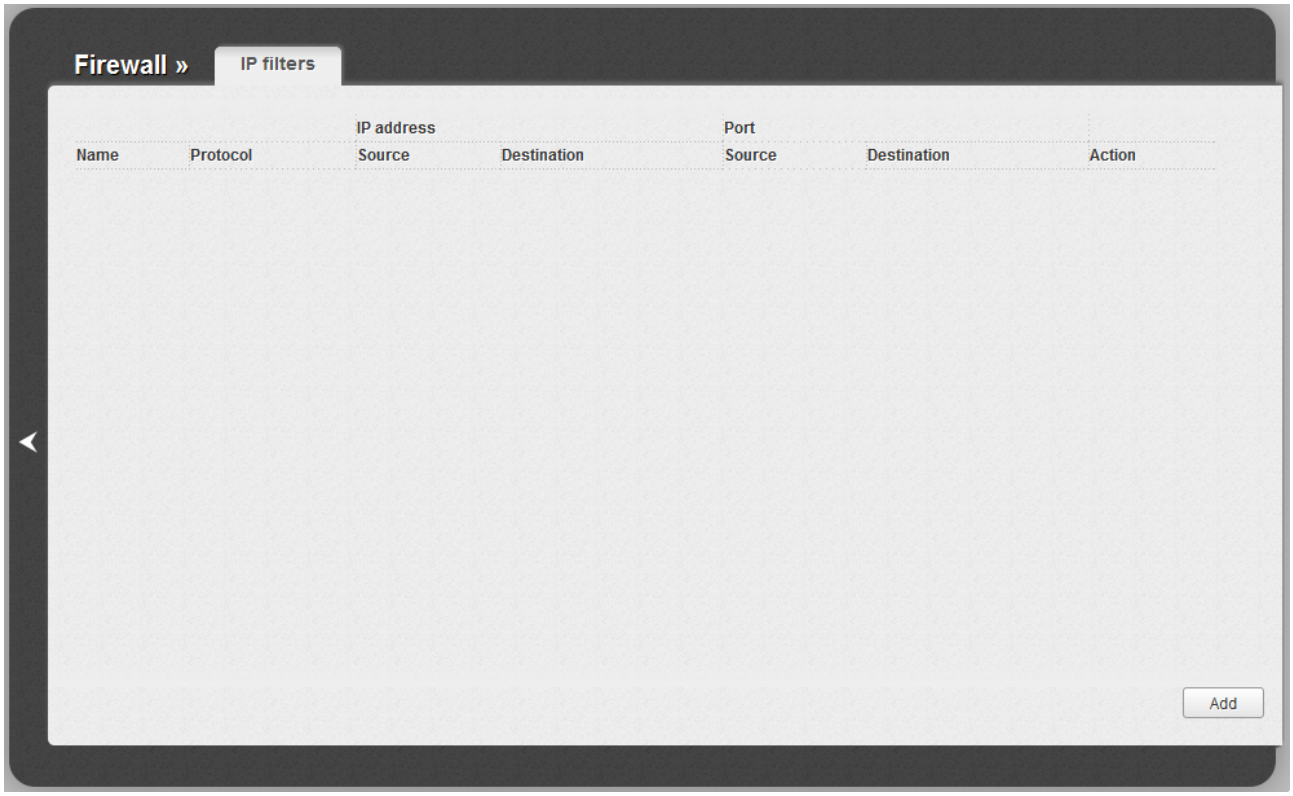

*Figure 111. The **Firewall / IP filters** page.*

To create a new rule, click the **Add** button.

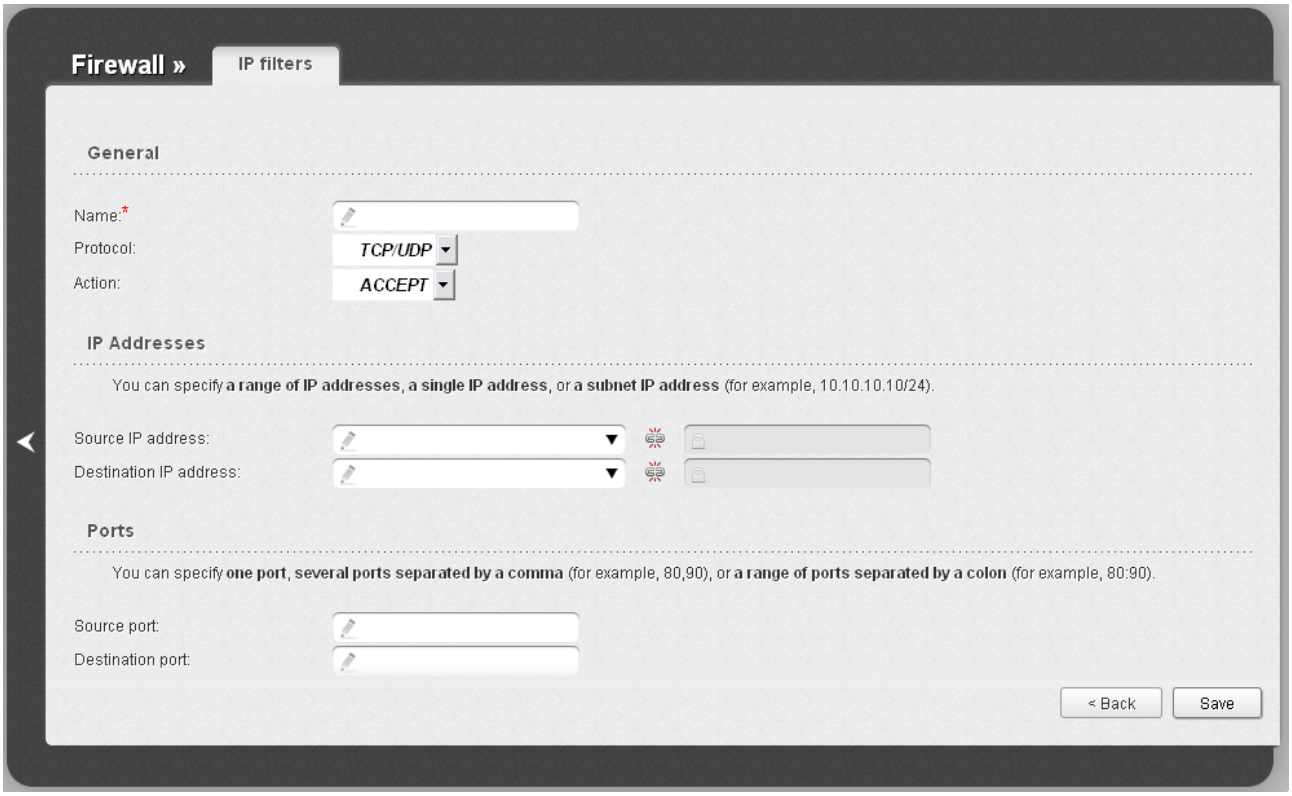
Firewall »
IP filters
General
Name:*
Protocol:
TCP/UDP
Action:
ACCEPT
IP Addresses
You can specify a range of IP addresses, a single IP address, or a subnet IP address (for example, 10.10.10.10/24).
Source IP address:
Destination IP address:
Ports
You can specify one port, several ports separated by a comma (for example, 80,90), or a range of ports separated by a colon (for example, 80:90).
Source port:
Destination port:
< Back
Save

Figure 112. The page for adding a rule for IP filtering.

You can specify the following parameters:

Parameter	Description
General	
Name	A name for the rule for easier identification.
Protocol	A protocol for network packet transmission. Select a value from the drop-down list.
Action	Select an action for the rule. **ACCEPT**: Allows packet transmission in accordance with the criteria specified by the rule. **DROP**: Denies packet transmission in accordance with the criteria specified by the rule.
IP Addresses	

Parameter	Description
Source IP address	The source host/subnet IP address. To choose a device connected to the router's LAN at the moment, select the relevant IP address from the drop-down list (the field will be filled in automatically). If you want to specify a range of IP addresses, click the **Range** icon ( ) and enter the starting and ending addresses in the left and right fields correspondingly.
Destination IP address	The destination host/subnet IP address. To choose a device connected to the router's LAN at the moment, select the relevant IP address from the drop-down list (the field will be filled in automatically). If you want to specify a range of IP addresses, click the **Range** icon ( ) and enter the starting and ending addresses in the left and right fields correspondingly.
Ports	
Source port	A port of the source IP address. You can specify one port, several ports separated by a comma, or a range of ports separated by a colon.
Destination port	A port of the destination IP address. You can specify one port, several ports separated by a comma, or a range of ports separated by a colon.

Click the **Save** button.

To edit a rule for IP filtering, click the link to the relevant rule. On the opened page, change the needed parameters and click the **Save** button.

To remove a rule for IP filtering, click the link to the relevant rule. On the opened page, click the **Delete** button.

To remove all rules from this page, click the **Clear all** button (the button is displayed if at least one rule exists).

Virtual Servers

On the **Firewall / Virtual servers** page, you can create virtual servers for redirecting incoming Internet traffic to a specified IP address in the local area network.

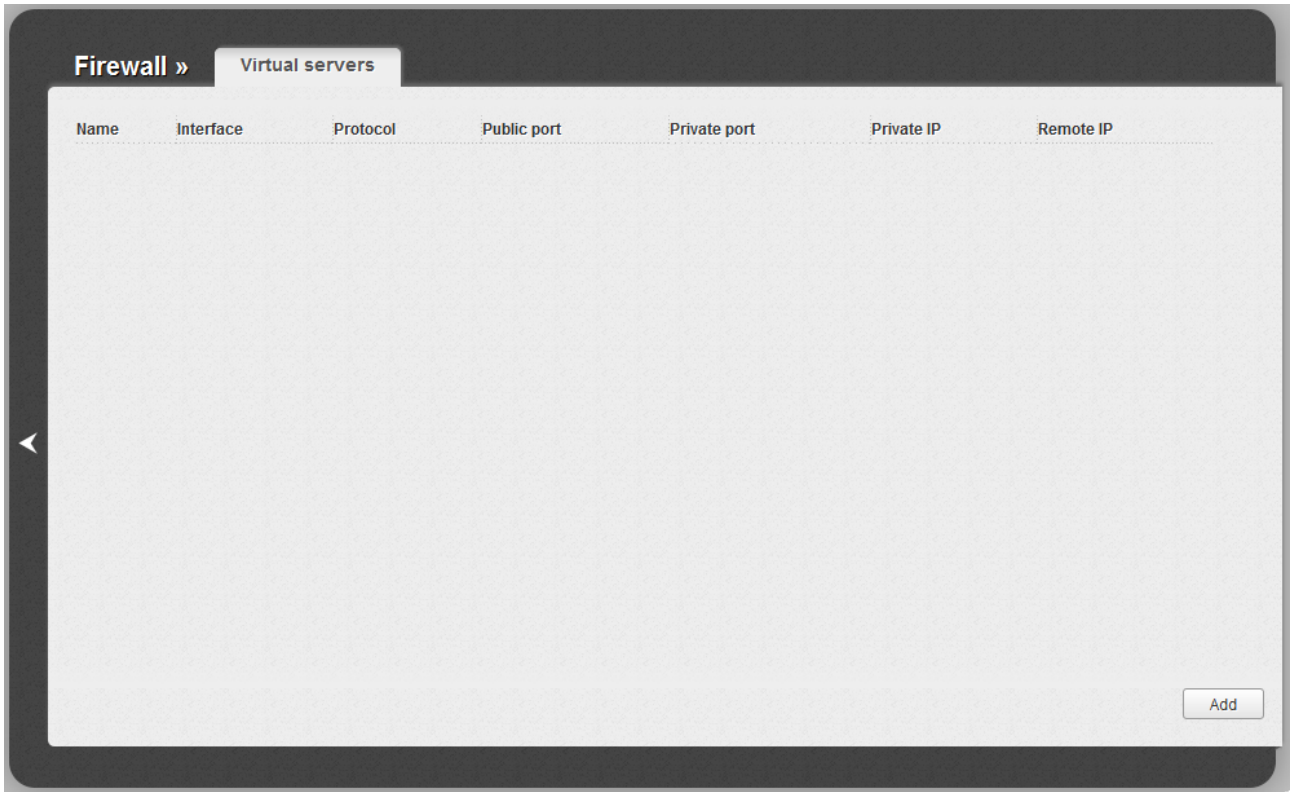

*Figure 113. The **Firewall / Virtual servers** page.*

To create a new virtual server, click the **Add** button.

Figure 114. The page for adding a virtual server.

You can specify the following parameters:

Parameter	Description
Template	Select a virtual server template from the drop-down list, or select **Custom** to specify all parameters of the new virtual server manually.
Name	A name for the virtual server for easier identification. You can specify any name.
Interface	A WAN connection to which this virtual server will be assigned.
Protocol	A protocol that will be used by the new virtual server. Select a value from the drop-down list.
Public port (begin)/ Public port (end)	A port of the router from which traffic is directed to the IP address specified in the **Private IP** field. Specify the start and the end value for the port range. If you need to specify one port, enter the needed value in the **Public port (begin)** field and leave the **Public port (end)** field blank.
Private port (begin)/ Private port (end)	A port of the IP address specified in the **Private IP** field to which traffic is directed from the **Public port**. Specify the start and the end value for the port range. If you need to specify one port, enter the needed value in the **Private port (begin)** field and leave the **Private port (end)** field blank.

Parameter	Description
Private IP	The IP address of the server from the local area network. To choose a device connected to the router's LAN at the moment, select the relevant value from the drop-down list (the field will be filled in automatically).
Remote IP	The IP address of the server from the external network.

Click the **Save** button.

To edit the parameters of an existing server, follow the link with the name of the server. On the opened page, change the needed parameters and click the **Save** button.

To remove an existing server, follow the link with the name of the server. On the opened page, click the **Delete** button.

To remove all servers from this page, click the **Clear all** button (the button is displayed if at least one server exists).

DMZ

A DMZ is a host or network segment located “between” internal (local) and external (global) networks. In the router, the DMZ implements the capability to transfer a request coming to a port of the router from the external network to a specified host of the internal network.

On the **Firewall / DMZ** page you can specify the IP address of the DMZ host.

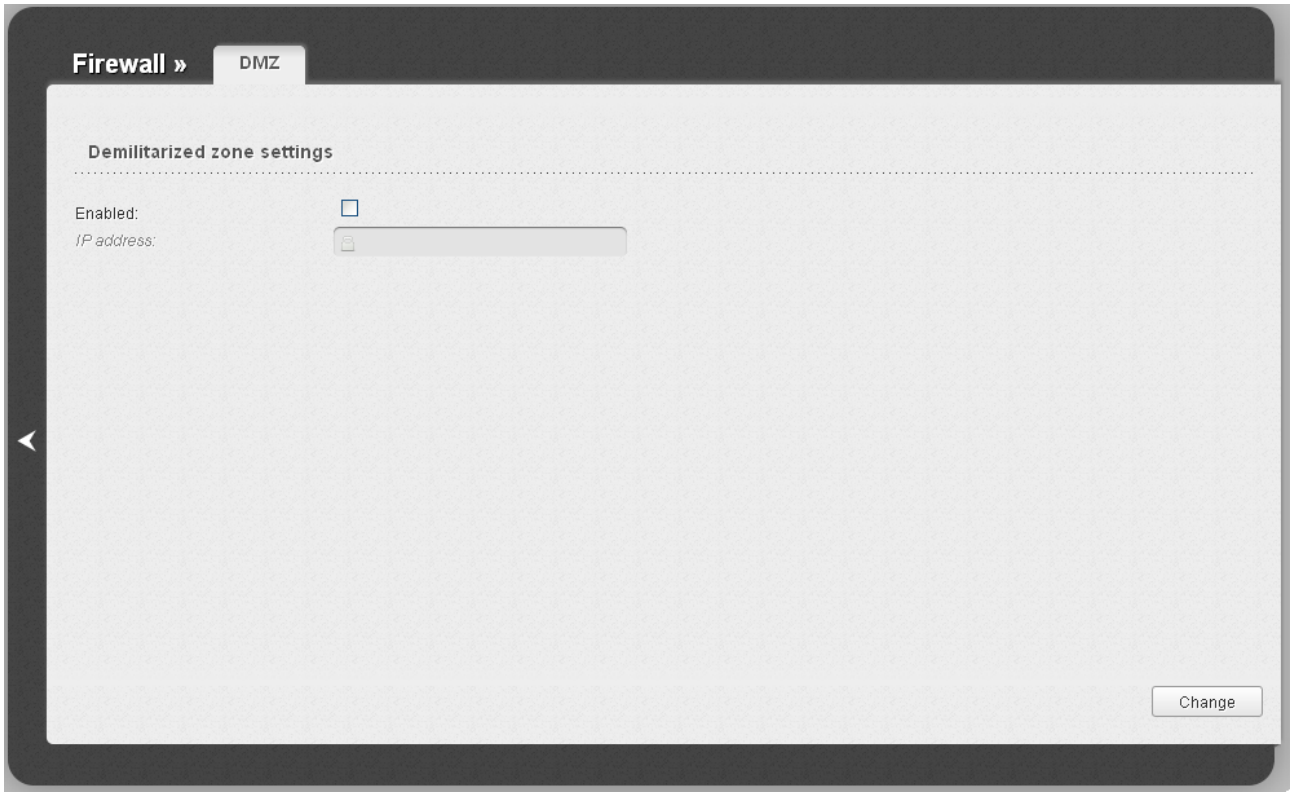

*Figure 115. The **Firewall / DMZ** page.*

To enable the DMZ, select the **Enabled** checkbox, enter the IP address of a host from your network in the **IP address** field, and click the **Change** button. To choose a device connected to the router's LAN at the moment, select the relevant value from the drop-down list (the field will be filled in automatically).

Note that when the DMZ is enabled, all traffic coming to a port of the WAN interface of the router is directed to the same port of the specified IP address. Also note that virtual servers have higher priority than the DMZ host. In other words, if there has been created a virtual server that directs traffic from external port 80 to a port of the device from the router's local network, then entering `http://router_WAN_IP` in the address bar, users of the external network are directed to the specified port and IP address configured for the virtual server, but not to port 80 of the device with the IP address specified on the **Firewall / DMZ** page.

To disable the DMZ, deselect the **Enabled** checkbox and click the **Change** button.

MAC Filter

On the **Firewall / MAC filter** page, you can configure MAC-address-based filtering for computers of the router's LAN.

*Figure 116. The **Firewall / MAC filter** page.*

To create a new rule for filtering, click the **Add** button. In the line displayed, you can specify the following parameters:

Parameter	Description
MAC address	The MAC address of a device from the router's LAN. You can enter the MAC address of a device connected to the router's LAN at the moment. To do this, select the relevant device from the **Known IP/MAC addresses** drop-down list (the field will be filled in automatically).
Action	Select an action for the rule. **Deny**: Blocks access to the router's network for the device with the specified MAC address. **Allow**: Allows access to the router's network and to the Internet for the device with the specified MAC when the rules on the **Firewall / IP filters** page block access for this device.

After specifying the needed parameters, click the **Save** button.

To edit a rule for filtering, select a needed field in the relevant line of the table, change its value, and click the **Save** button.

To remove a rule for filtering, select the checkbox located to the left of the relevant line in the table and click the **Save** button.

Control

This menu is designed to create restrictions on access to certain web sites.

URL Filter

On the **Control / URL filter** page, you can specify restrictions on access to certain web sites.

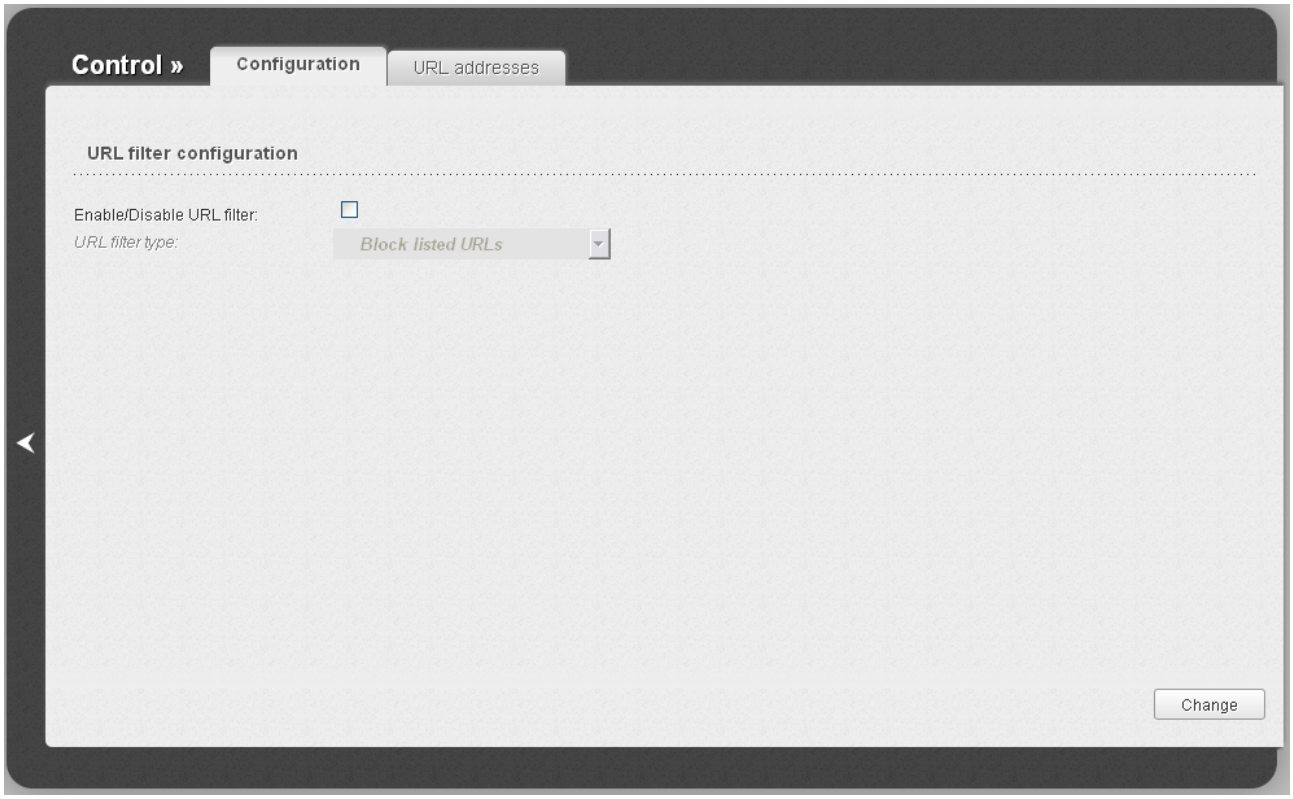

*Figure 117. The **Control / URL filter** page. The **Configuration** tab.*

To enable the URL filter, select the **Enable/Disable URL filter** checkbox on the **Configuration** tab, then select a needed mode from the **URL filter type** drop-down list:

- **Block listed URLs**: when this value is selected, the router blocks access to all addresses specified on the **URL addresses** tab;
- **Block all URLs except listed**: when this value is selected, the router allows access to addresses specified on the **URL addresses** tab and blocks access to all other web sites.

Click the **Change** button.

To specify URL addresses to which the selected filtering will be applied, go to the **URL addresses** tab.

*Figure 118. The **Control / URL filter** page. The **URL addresses** tab.*

Click the **Add** button and enter an address in the field displayed. Then click the **Save** button.

To remove an address from the list of URL addresses, select the checkbox located to the left of the relevant URL address and click the **Save** button.

System

In this menu you can do the following:

- change the password used to access the router's settings
- save the current settings to the non-volatile memory
- create a backup of the router's configuration
- restore the router's configuration from a previously saved file
- restore the factory default settings
- view the system log
- update the firmware of the router
- configure automatic synchronization of the system time or manually configure the date and time for the router
- check availability of a host on the Internet through the web-based interface of the router
- trace the route to a host
- allow or forbid access to the router via TELNET.

Administrator Password

On the **System / Administrator password** page, you can change the password for the administrator account used to access the web-based interface of the router and to access the device settings via TELNET.

! For security reasons, it is strongly recommended to change the administrator password upon initial configuration of the router.

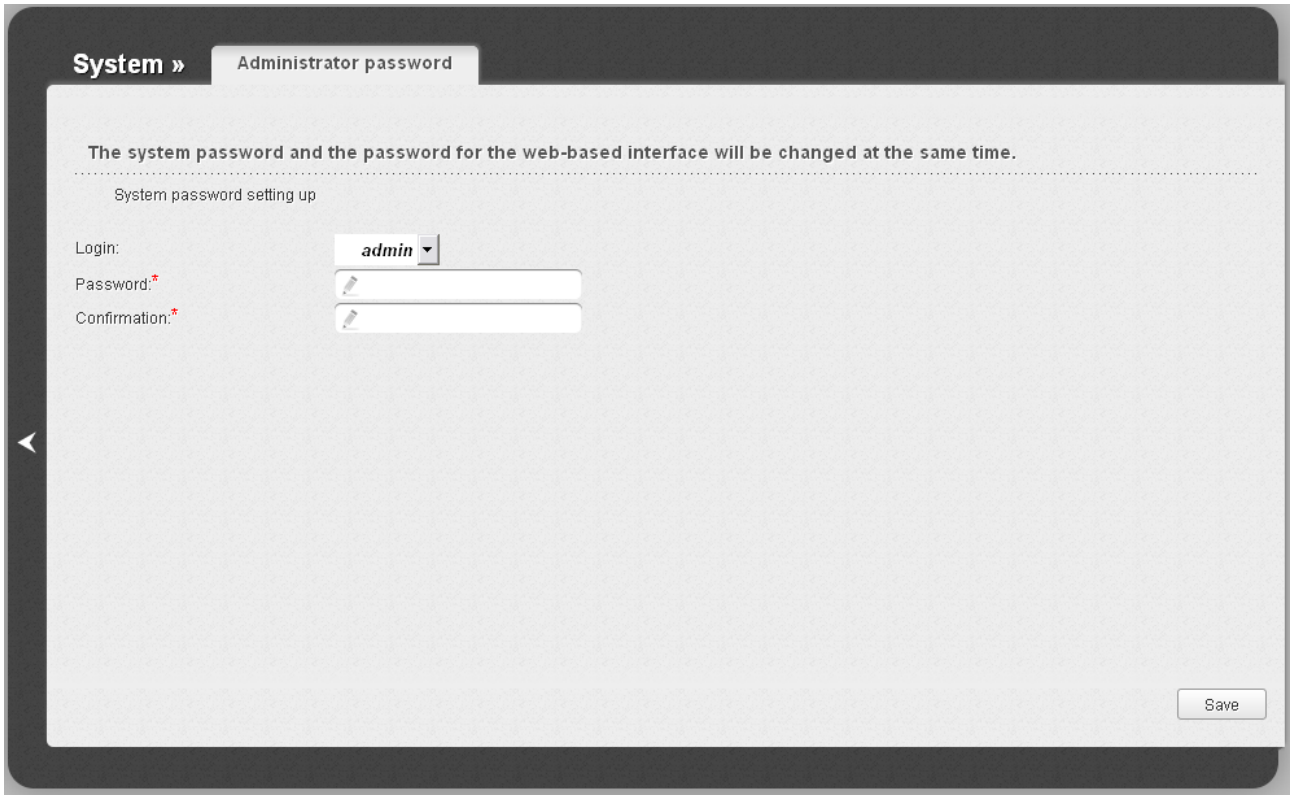

Figure 119. The page for modifying the administrator password.

Enter the new password in the **Password** and **Confirmation** fields and click the **Save** button.

Configuration

On the **System / Configuration** page, you can save the changed settings to the non-volatile memory, restore the factory defaults, backup the current configuration, or restore the router's configuration from a previously created file.

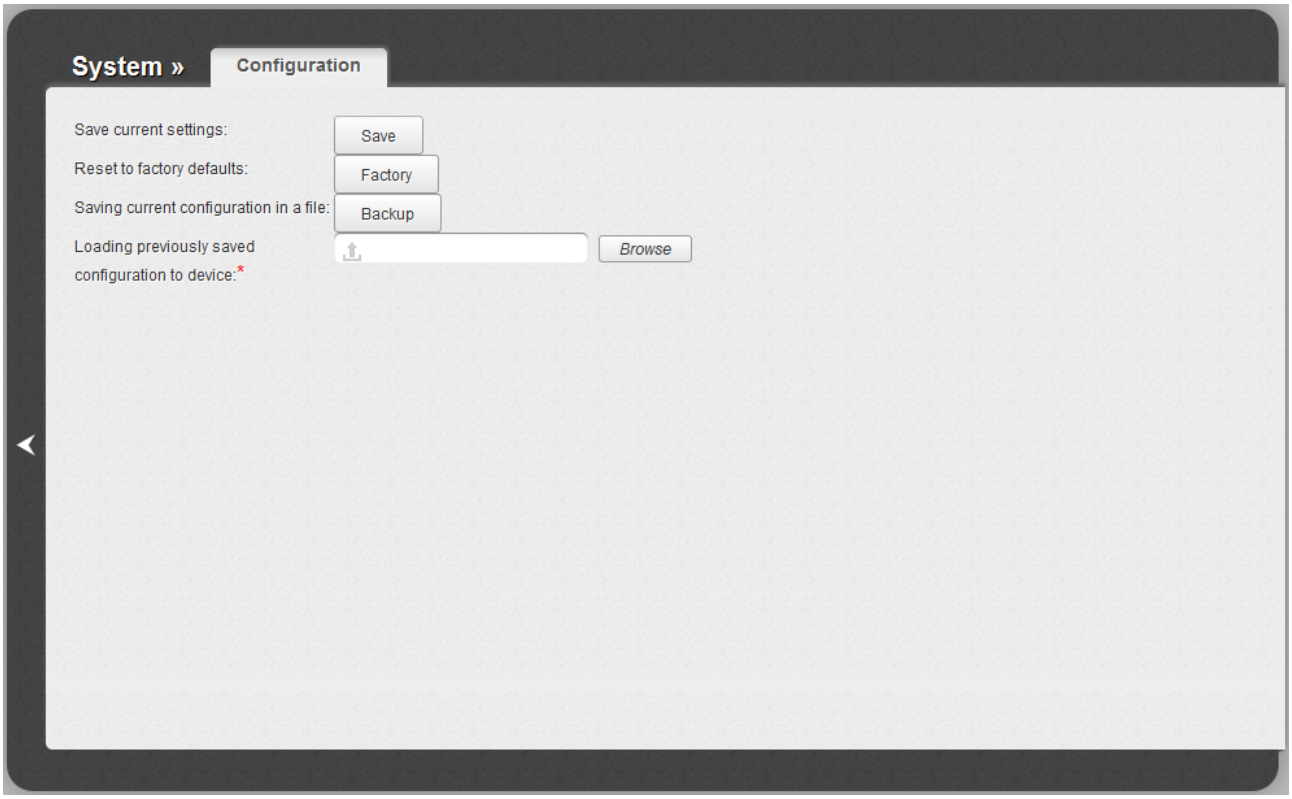

*Figure 120. The **System / Configuration** page.*

The following buttons are available on the page:

Control	Description
Save	Click the button to save settings to the non-volatile memory. Please, save settings every time you change the router's parameters. Otherwise the changes will be lost upon hardware reboot of the router.
Factory	Click the button to restore the factory default settings. Also you can restore the factory defaults via the hardware **RESET** button (see the ***Saving and Restoring Settings*** section, page 34).
Backup	Click the button and follow the dialog box appeared to save the configuration (all settings of the router) to your PC.
Browse	Click the button and follow the dialog box appeared to select a previously saved configuration file (all settings of the router) located on your PC and upload it.

Actions of the **Save**, **Factory**, and **Backup** buttons also can be performed via the top-page menu displayed when the mouse pointer is over the **System** caption.

System Log

On the **System / System log** page, you can set the system log options and configure sending the system log to a remote host.

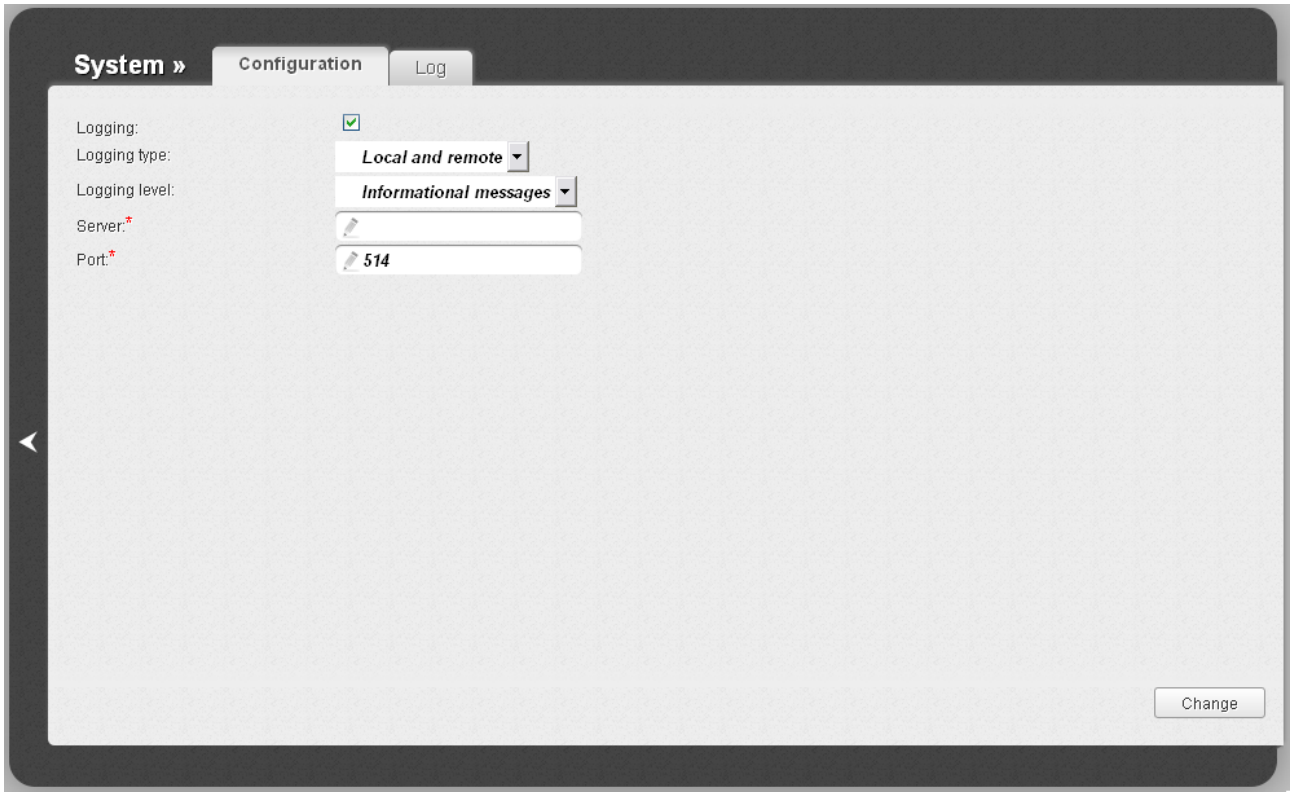

*Figure 121. The **System / System log** page. The **Configuration** tab.*

To enable logging of the system events, select the **Logging** checkbox on the **Configuration** tab. Then specify the needed parameters.

Control	Description
Logging type	Select a type of logging from the drop-down list. • **Local**: the system log is stored in the router's memory (and displayed on the **Log** tab). When this value is selected, the **Server** and **Port** fields are not displayed. • **Remote**: the system log is sent to the remote host specified in the **Server** field. • **Local and remote**: the system log is stored in the router's memory (and displayed on the **Log** tab) and sent to the remote host specified in the **Server** field.
Logging level	Select a type of messages and alerts/notifications to be logged.
Server	The IP or URL address of the host from the local or global network, to which the system log will be sent.

Control	Description
Port	A port of the host specified in the **Server** field. By default, the value `514` is specified.

After specifying the needed parameters, click the **Change** button.

To disable logging of the system events, deselect the **Logging** checkbox and click the **Change** button.

On the **Log** tab, the events specified in the **Logging level** list are displayed.

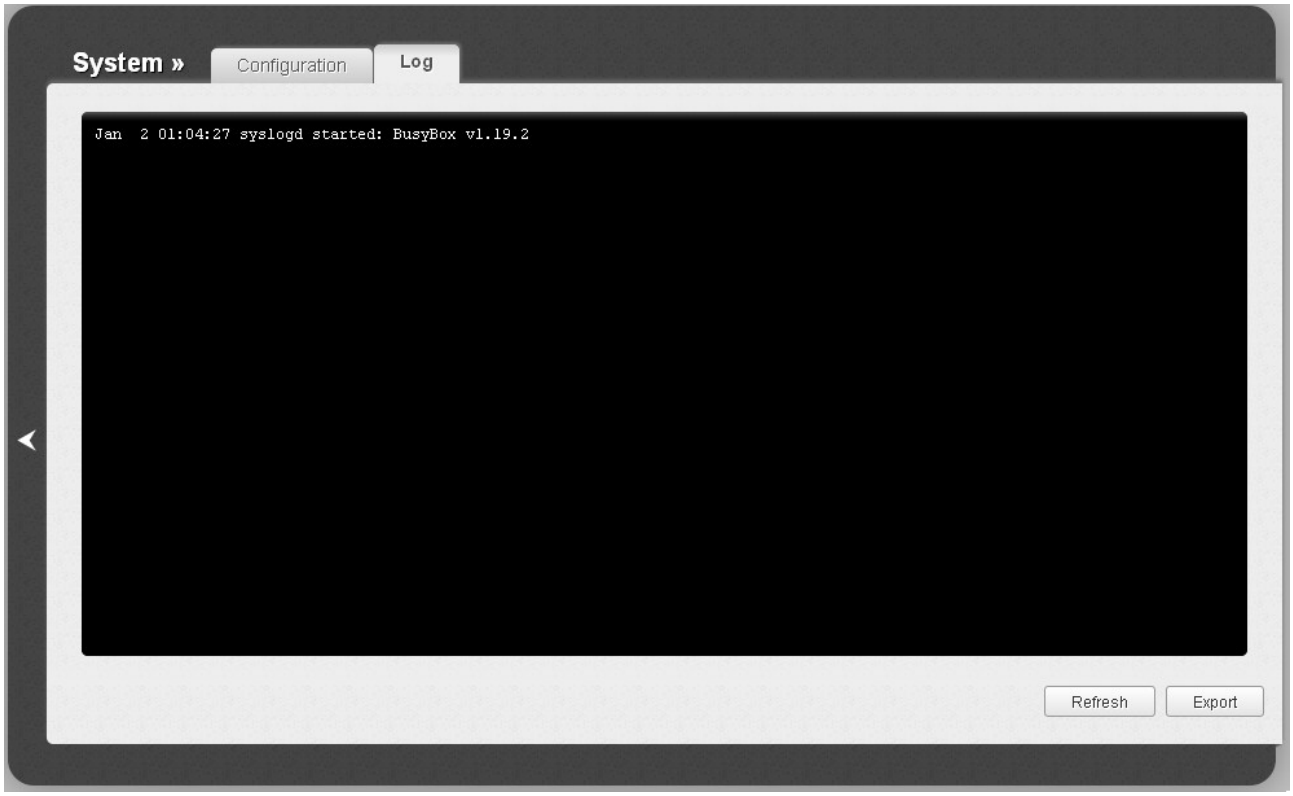

*Figure 122. The **System / System log** page. The **Log** tab.*

To view the latest system events, click the **Refresh** button.

To save the system log to your PC, click the **Export** button and follow the dialog box appeared.

Firmware Upgrade

On the **System / Firmware upgrade** page, you can upgrade the firmware of the router.

> **!** Upgrade the firmware only when the router is connected to your PC via a wired connection.

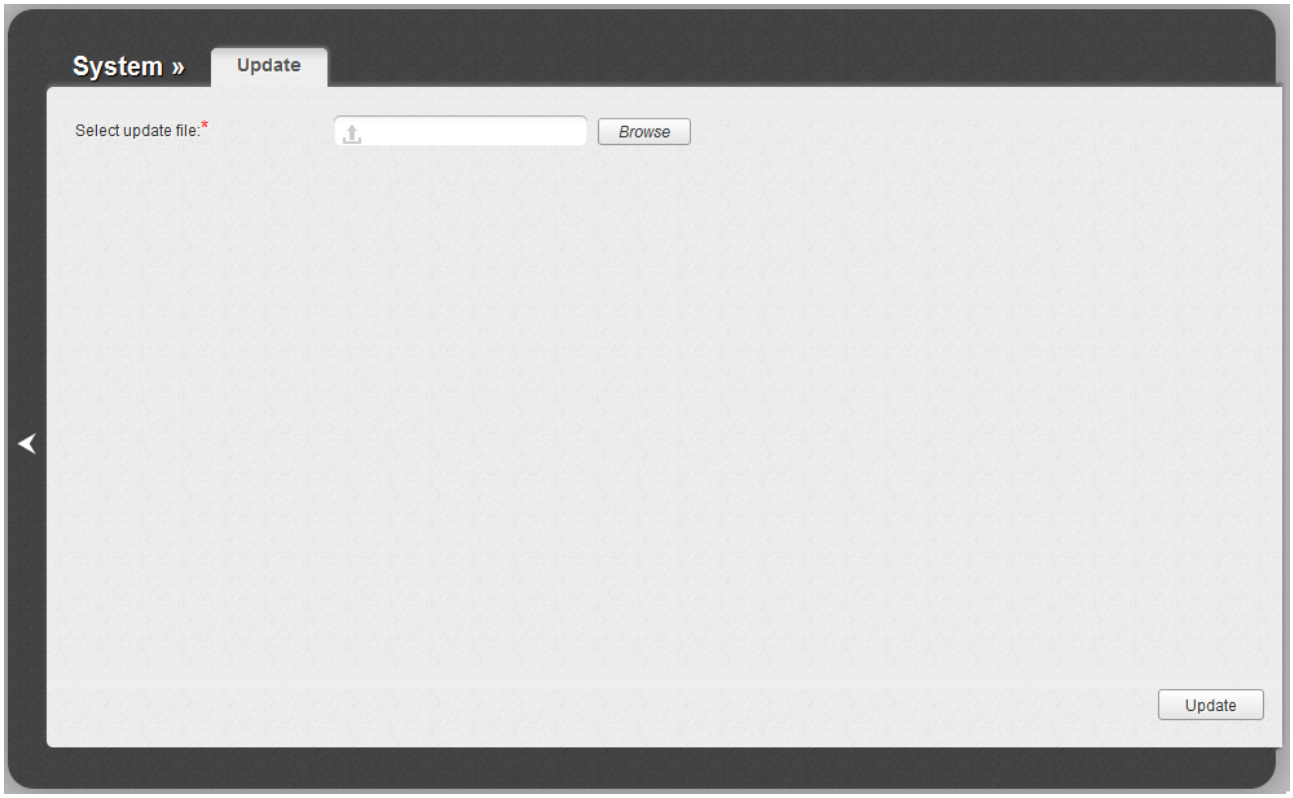

*Figure 123. The **System / Firmware upgrade** page.*

The current version of the router's firmware is displayed in the **Firmware version** field located next the D-Link logo in the top left corner of the page. If you need to install a newer version of the firmware, follow the next steps:

> **!** Attention! Do not turn off the router before the firmware upgrade is completed. This may cause the device breakdown.

1. Download a new version of the firmware from www.dlink.ru.
2. Click the **Browse** button on the **System / Firmware upgrade** page to locate the new firmware file.
3. Click the **Update** button to upgrade the firmware of the router.
4. Wait until the router is rebooted (about one and a half or two minutes).
5. Log into the web-based interface using the login (**admin**) and the current password.

6. Select the **Factory** line in the top-page menu displayed when the mouse pointer is over the **System** caption.
7. Wait until the router is rebooted. Log into the web-based interface, using the default IP address, login and password (**192.168.0.1**, **admin**, **admin**).

NTP Client

On the **System / NTP client** page, you can manually set the time and date of the router or configure automatic synchronization of the system time with a time server on the Internet.

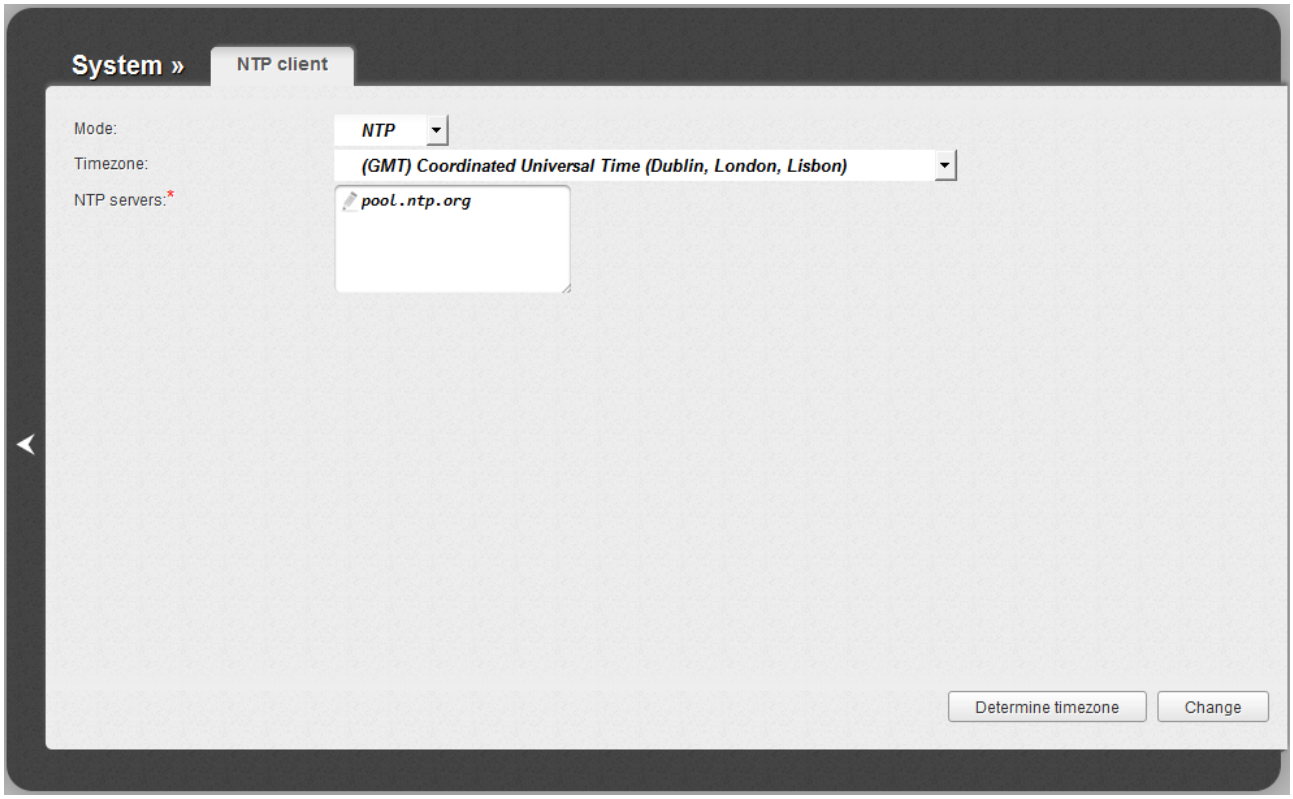

*Figure 124. The **System / NTP client** page.*

To set the system time manually, select the **Manual** value from the **Mode** drop-down list and set the time and date in the fields displayed. Then click the **Change** button.

To enable automatic synchronization with a time server, follow the next steps:

1. Select the **NTP** value from the **Mode** drop-down list.
2. Select your time zone from the drop-down list. To set the time zone in accordance with the settings of your operating system, click the **Determine timezone** button in the bottom right corner of the page.
3. Specify the needed NTP server in the **NTP servers** field or leave the server specified by default.
4. Click the **Change** button.

! When the router is powered off or rebooted, the system time is reset to the default value. If you have set automatic synchronization for the system time, the internal clock of the device will be configured after connecting to the Internet. If you have set the system time manually, you need to set the time and date again (see above).

Ping

On the **System / Ping** page, you can check availability of a host from the local or global network via the Ping utility.

The Ping utility sends echo requests to a specified host and receives echo replies.

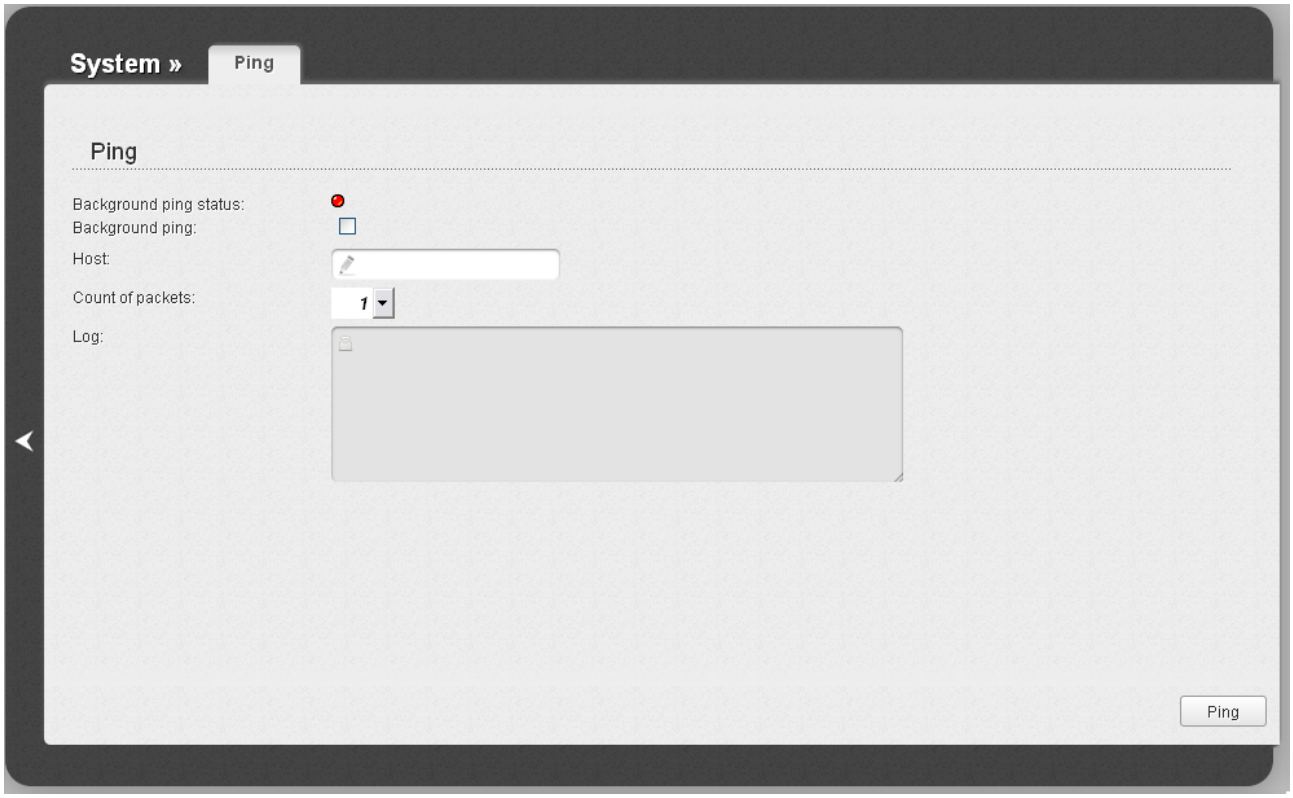

*Figure 125. The **System / Ping** page.*

To check availability of a host, enter the IP address or name of this host in the **Host** field, and select a number of requests that will be sent in order to check its availability from the **Count of packets** drop-down list. Click the **Ping** button. The check results will be displayed in the **Log** field.

Also you can run the Ping function in the background mode. To do this, select the **Background ping** checkbox. Then enter the IP address or name of a host in the **Host** field and click the **Ping** button. When this mode is selected, the **Count of packets** and **Log** fields are not displayed.

In the background mode, the Ping utility sends requests to the host specified in the **Host** field every 40 seconds. The **Background ping status** light shows the status of the Ping function (green light: the function is running, red light: the function is not running).

To stop running the Ping function in the background mode, deselect the **Background ping** checkbox, enter the IP address or name of a host in the **Host** field, and click the **Ping** button.

Traceroute

On the **System / Traceroute** page, you can define the route of data transfer to a host via the traceroute utility.

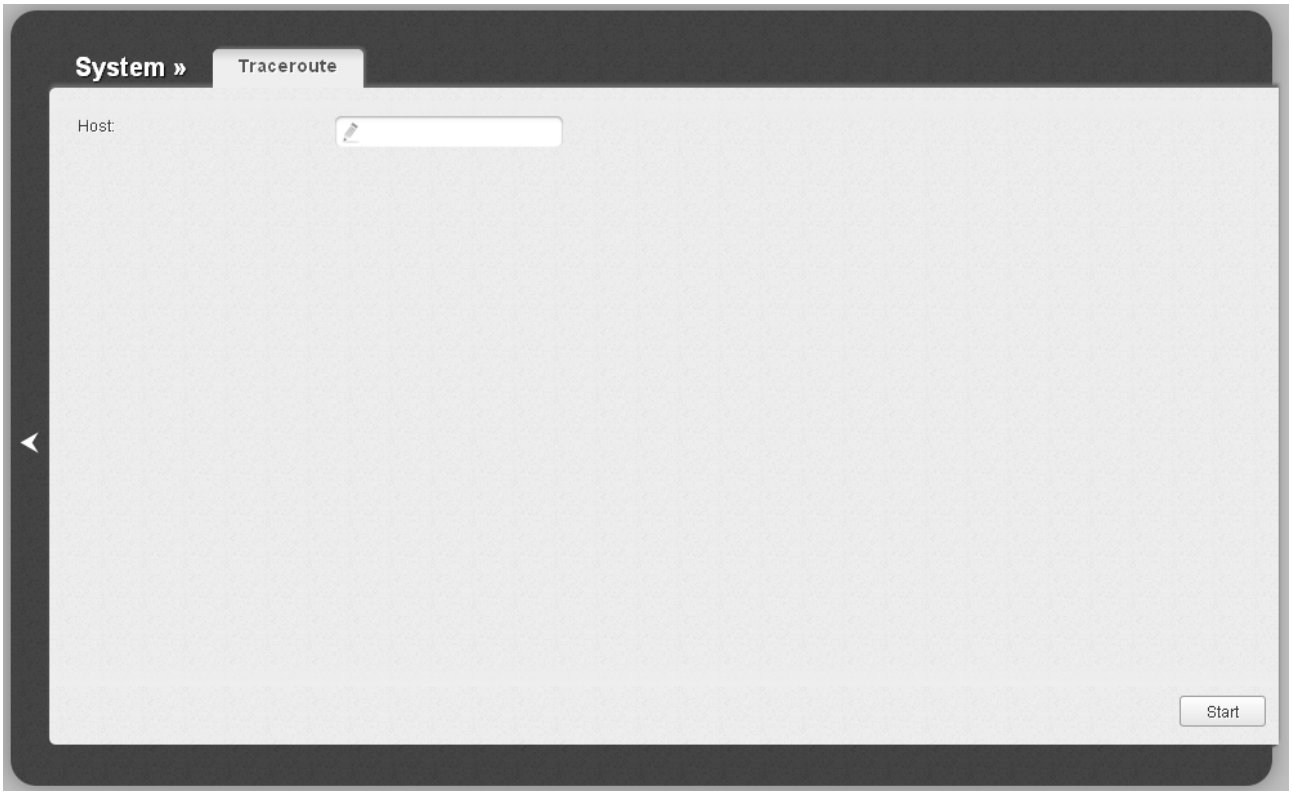

*Figure 126. The **System / Traceroute** page.*

To define the route, enter the name or IP address of a host in the **Host** field and click the **Start** button. After a while, the results will be displayed on the page.

Telnet

On the **System / Telnet** page, you can enable or disable access to the device settings via TELNET from your LAN. By default, access is enabled.

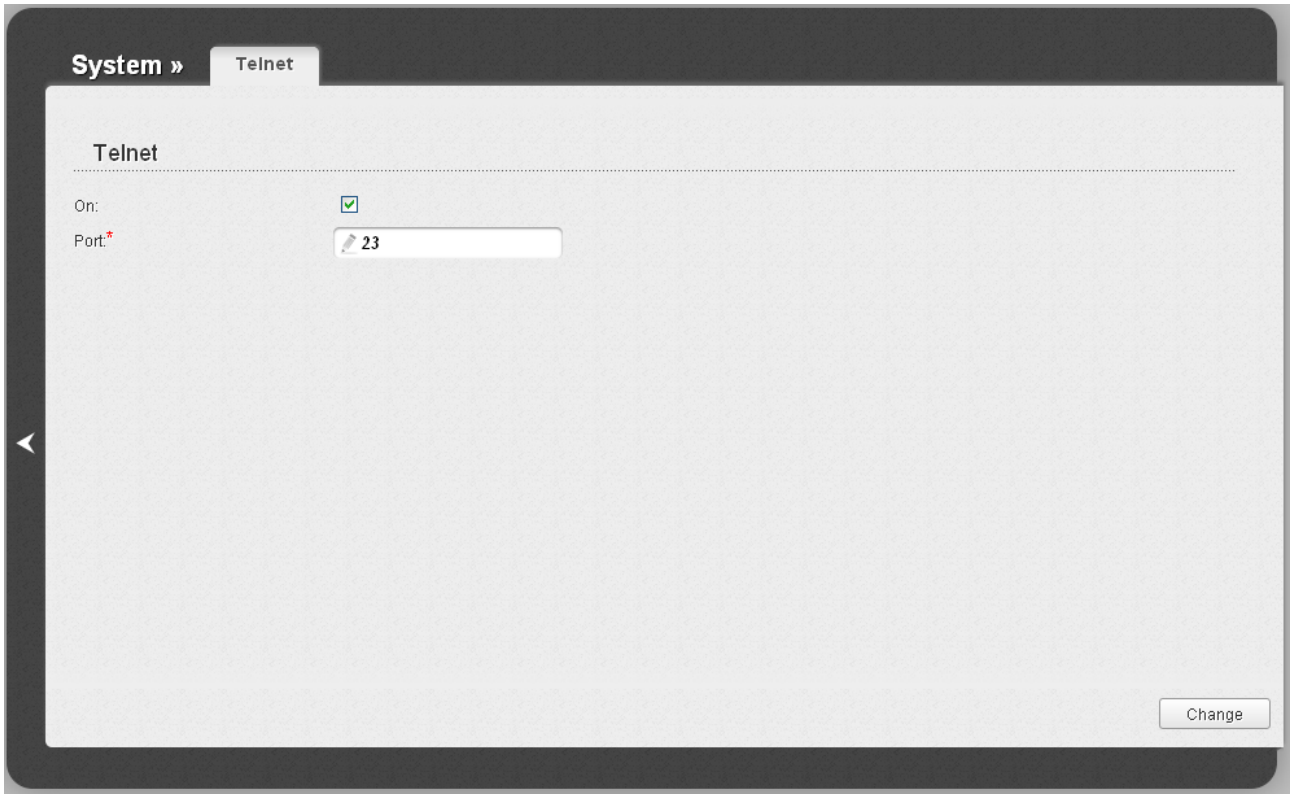

*Figure 127. The **System / Telnet** page.*

To disable access via TELNET, deselect the **On** checkbox and click the **Change** button.

To enable access via TELNET again, select the **On** checkbox. In the **Port** field, enter the number of the router's port through which access will be allowed (by default, the port `23` is specified). Then click the **Change** button.

CHAPTER 5. OPERATION GUIDELINES

Safety Instructions

Place your router on a flat horizontal surface or mount the router on the wall (the mounting holes are located on the back panel of the device). Make sure that the router is provided with sufficient ventilation.

To prevent overheating, do not obstruct the ventilation openings of the router.

Plug the router into a surge protector to reduce the risk of damage from power surges and lightning strikes.

Operate the router only from an electrical outlet with the correct power source as indicated on the adapter.

Do not open the cover of the router. Otherwise any warranty will be invalidated.

Unplug the equipment before dusting and cleaning. Use a damp cloth to clean the equipment. Do not use liquid/aerosol cleaners or magnetic/static cleaning devices.

Wireless Installation Considerations

The DIR-815 device lets you access your network using a wireless connection from virtually anywhere within the operating range of your wireless network. Keep in mind, however, that the number, thickness and location of walls, ceilings, or other objects that the wireless signals must pass through, may limit the range. Typical ranges vary depending on the types of materials and background RF noise in your home or office. To maximize your wireless range, follow the guidelines below.

1. Keep the number of walls and ceilings between the DIR-815 device and other network devices to a minimum – each wall or ceiling can reduce your wireless network range by 3-90 feet (1-30 meters).
2. Be aware of the direct line between network devices. Place your devices so that the signal travels straight through a wall or ceiling (instead of at an angle) for better reception.
3. Building materials make a difference. A solid metal door or aluminum studs may have a negative effect on your wireless range. Try to position your router, access points, and computers so that the signal passes through drywalls or open doorways. Materials and objects such as glass, steel, metal, walls with insulation, water (fish tanks), mirrors, file cabinets, brick, and concrete will degrade your wireless signal.
4. Keep your router away (at least 3-6 feet or 1-2 meters) from electrical devices or appliances that generate RF noise.
5. If you are using 2.4 GHz cordless phones or X-10 equipment (wireless devices such as ceiling fans, lights, and home security systems), your wireless connection may degrade dramatically or drop completely. Make sure your 2.4 GHz phone base is as far away from your wireless devices as possible. Note, that the base transmits a signal even if the phone in not in use.

Connecting to Cable or DSL Modem

If you need to connect the router to a cable or DSL modem, do the following.

1. Place the router in an open location in the supposed center of your wireless network. Do not plug the power adapter into the router.
2. Turn off your PC.
3. Unplug the Ethernet cable (that connects your PC to your modem) from your computer and place it into the **INTERNET** port of your router.
4. Plug another Ethernet cable into one of the four LAN ports on the router. Plug the other end into the Ethernet port of your PC.
5. Turn on your modem. Wait until the modem is booted (about 30 seconds).
6. Plug the power adapter to the router and connect to an electrical outlet or power strip. Wait until the router is booted (about 30 seconds).
7. Turn on your PC.
8. Verify the LEDs of the router. The following LEDs should be on: **POWER**, **LAN** (of the relevant Ethernet port), and **INTERNET**. If not, make sure that your computer, modem, and router are powered on and the relevant cables are connected correctly.

CHAPTER 6. ABBREVIATIONS AND ACRONYMS

AC	Access Category
AES	Advanced Encryption Standard
ARP	Address Resolution Protocol
BSSID	Basic Service Set Identifier
CRC	Cyclic Redundancy Check
DDNS	Dynamic Domain Name System
DDoS	Distributed Denial of Service
DHCP	Dynamic Host Configuration Protocol
DMZ	DeMilitarized Zone
DNS	Domain Name System
DTIM	Delivery Traffic Indication Message
GMT	Greenwich Mean Time
IGMP	Internet Group Management Protocol
IP	Internet Protocol
ISP	Internet Service Provider
L2TP	Layer 2 Tunneling Protocol
LAN	Local Area Network
LCP	Link Control Protocol
MAC	Media Access Control
MTU	Maximum Transmission Unit
NAT	Network Address Translation
NTP	Network Time Protocol
PBC	Push Button Configuration
PIN	Personal Identification Number
PPPoE	Point-to-point protocol over Ethernet
PPTP	Point-to-point tunneling protocol
PSK	Pre-shared key
QoS	Quality of Service
RADIUS	Remote Authentication in Dial-In User Service
RIP	Routing Information Protocol

RTS	Request To Send
SMB	Server Message Block
SSID	Service Set Identifier
TKIP	Temporal Key Integrity Protocol
UDP	User Datagram Protocol
UPnP	Universal Plug and Play
URL	Uniform Resource Locator
VLAN	Virtual Local Area Network
VPN	Virtual Private Network
WAN	Wide Area Network
WEP	Wired Equivalent Privacy
Wi-Fi	Wireless Fidelity
WISP	Wireless Internet Service Provider
WLAN	Wireless Local Area Network
WMM	Wi-Fi Multimedia
WPA	Wi-Fi Protected Access
WPS	Wi-Fi Protected Setup